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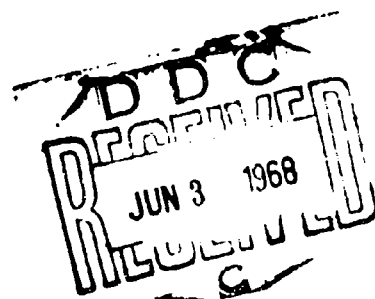


Prepared for:

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INSTITUTIONAL FACTORS IN TOTAL VULNERABILITY

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EXECUTIVE SUMMARY

This work unit is concerned with the vulnerability of the nation as a whole. The first report¹ developed a methodology for analyzing the vulnerability of the United States as a large system made up of three interacting subsystems: an economic system, a political system, and a social system. That study identified 23 major institutions regarded as subsystems, including such institutions as political parties, associations, contracts, property, and credit. It traced interrelations among these at least to the extent of identifying inputs and outputs for each and also identified all institutions associated with each input or output. The practical significance of the systems approach was its use in helping to identify institutional problems likely to be neglected in analyses of the vulnerability of the physical systems.

This report concentrates on a few specific organizational problems relating either to the economic system or to the political system. These are:

1. Solvency of individuals and business entities
2. Mobility of money and credit
3. Business management succession and corporate organization
4. Vulnerability of normal business channels
5. Legislative imbalances at federal, state, and local levels
6. Vulnerability of normal election machinery.

This report discusses these problems and their implications for the assessment of national vulnerability. The findings indicate that none of these problems pose insurmountable difficulties, but do require prompt attention and appropriate or equitable resolution within the first two months after

¹ Dresch, Francis W., and Hazel Ellis, Methodology for Assessing Total Vulnerability (prepared for Office of Civil Defense), Stanford Research Institute, Menlo Park, California, August 1966

an attack. The postattack period will require unprecedented interaction between government and business with business participating in quasi-governmental activity, particularly at the local level, and government engaged in quasi-industrial decision-making, particularly at the federal level and in connection with facility construction. It will also entail a greatly increased role for local business management, that is, at the plant management level.

ABSTRACT

A systems approach has been used to identify institutional problems likely to be neglected in analyses of the vulnerability of physical systems at risk from nuclear attack.

This report discusses six specific problems (solvency, credit, business organization and management, interdiction of normal business channels, legislative imbalance, and disruption of election machinery) and their implications for the assessment of national vulnerability. None of the problems would pose insurmountable difficulties but all would require prompt attention and appropriate resolution within the first two months after a nuclear attack.

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I INTRODUCTION AND SUMMARY

The development of weapon systems including aircraft for launching intercontinental thermonuclear attacks raised serious questions as to the possibilities for national survival after any nuclear exchange. Extensive research by many workers, however, has failed to demonstrate that any attack that might come in the next decade could preclude eventual economic recovery. Primary emphasis in vulnerability research has been on physical impediments to production, transportation, and utility services. Only limited attention has been given to the vulnerability of social, political, and managerial institutions.

A previous study by Stanford Research Institute developed an institutional approach for analyzing societal effects of attack.¹ The present report has a similar institutional emphasis but it is much narrower in scope. Its objective is to investigate the possible consequences of any breakdown of various institutional arrangements underlying modern industrial activity--such as credit, national markets, corporate organization, and various political arrangements. Consideration of problems identified includes assessment of possible effects that would degrade inherent recovery capability. Specifically, this study is concerned with four aspects of business and two aspects of political structure.

1. Solvency of individuals and business entities
2. Mobility of money and credit
3. Business management succession and corporate organization
4. Vulnerability of normal business channels
5. Legislative imbalances at federal, state, and local levels
6. Vulnerability of normal election machinery

¹ Dresch, Francis W., and Hazel Ellis, Methodology for Assessing Total Vulnerability (prepared for Office of Civil Defense), Stanford Research Institute, Menlo Park, California, August 1966

The devastation from an attack would constitute a tremendous loss of real property, but might not lead to widespread insolvency. The total net worth of industrial corporations in the United States is approximately equal to the current value of their physical holdings of depreciable assets. The loss of residential housing could remove the security for home mortgages and installment credit, and could thus present a very serious problem for financial corporations such as insurance companies and, especially, banks and lending agencies. Insolvency of the financial sector of the economy could have widespread repercussions throughout the security markets and could conceivably threaten the whole institution of private property. This is examined in greater detail in Chapter II. Consideration is also given in that chapter to the possible effects of such financial instability on the money market and on credit instruments and arrangements generally.

The vulnerability of corporate structure, degree of centralization, arrangements for management succession, other constraints affecting the legal bases for authority, and sensitivity to a shortage of managerial personnel are considered in Chapter III.

Chapter IV is concerned with the effects of probable disruption of normal channels of business activity and possible denial of specialized business services following breakdown or overloading of present systems of transportation and communications.

Chapter V discusses the effects of probable changes in the relations between government and business resulting from special emergency requirements and from changes in functions, operating environment, and staffing--both for governmental agencies and business organizations.

Chapter VI is concerned with the implications of the material presented in the first five chapters with respect to vulnerability of productivity and the economic life of the individual in postattack society.

Chapter VII considers the possible degree of legislative imbalance as a result of attack fatalities or resettlement of survivors. Such events could lead to loss of representation or ambiguous representation as well as representatives without constituencies. Possibilities are examined at federal, state, and local levels.

Chapter VIII is concerned with the vulnerability of regular election procedures and election machinery including problems of reorganization of voter registration lists and party machinery.

Chapter IX discusses the implications of the political questions examined for possible effects on prompt resolution of other organizational issues relative to restoration of normal functioning of the economic system and to rational organization of recovery management efforts.

Most attack phenomena affect tangible property or people. Indirect effects of damage to housing, facilities, and inventories or of human casualties include insolvency of business and individuals, disruption of credit and contract arrangements, problems of managerial succession for government and business, other organizational and institutional breakdowns, and finally some tendency for preattack institutions to prove exceedingly vulnerable. The systems at risk in any thermonuclear attack include not only the military and industrial concentrations but also the intangible arrangements for controlling and managing such facilities and for governing the population. The physical target system is being studied extensively in other vulnerability research. Background information and insights from such studies are basic to the present report. The present study has made no attempt to generate information on physical vulnerability but is concerned exclusively with the intangible institutional aspects of the U.S. systems that are subject to secondary effects.

The institutions previously identified include such cultural or social institutions as language, family, group, school, church, association, community, and pressure groups. These have all been excluded from consideration in the present study to permit concentration on some of the institutions related to the economic and political systems. The reasons for selecting these institutions were that the probable effects on them are more susceptible to objective research and that the associated problems appeared to be of immediate importance for vulnerability analysis and pre-attack planning of countermeasures.

Underlying the present discussion of the institutions selected are some general assumptions about the near term threat. Much OCD research (and even more DOD research) is devoted to continuing reappraisal of the potential threat. For the present level of discussion of institutional problems, however, only very large differences in attack parameters are significant. The distinctions of greatest interest concern (1) whether the enemy would launch a pure counterforce attack or an all-out attack on centers of population and industry, (2) whether there would be an allocation of weapons to gasoline refineries and vital transportation nodes (primarily marshaling yards) of sufficient numbers to immobilize the country for a protracted period, (3) whether appreciable strategic or tactical warning would be provided and acted on, and (4) whether there would be any effective active or passive defense. In general, it has been assumed that the heaviest conceivable attack could successfully target all SMSAs and

any remaining sources of gasoline and diesel fuel, but that the number of available weapons would not suffice to appreciably disturb well-dispersed industrial establishments outside SMSAs.

Effective defenses made possible by preattack preparations and appropriate response to early warning could greatly reduce the effects of the heavy attack and minimize the magnitude of many problems identified in this report. The principal threat to national viability even under the most adverse circumstances appears to be the possibility of mismanagement of early rehabilitation and recovery efforts. Since the present state of knowledge does not permit confidence in descriptions of the probable environment, it is not possible to construct at present a complete and near optimal plan. Practical difficulties in implementing any standby or paper plans preclude adequate test and training exercises and argue for flexible approaches to recovery management leaving most of the details to be worked out after the attack. The resources left after the heaviest attack could leave so little in excess over minimum consumer essentials that almost perfect planning would be necessary to provide for capacity maintenance and regeneration. Waiting for the attack before starting such planning would obviously be hazardous. This presents an obvious dilemma for vulnerability research and for analysis of possible countermeasures.

The present study is devoted almost entirely to the vulnerability side of the threat-countermeasure-vulnerability triangle, although some suggestions for possible countermeasures are mentioned, without evaluation, primarily to illustrate the nature of the problems identified and the types of considerations that appear to be relevant. Some of these suggestions are examined further in a forthcoming report on information requirements for recovery management--an investigation sponsored jointly by the Office of Emergency Planning and the Postattack Planning Division of OCD.

The vulnerability problems highlighted in this report would be virtually impossible to solve in an unstable political environment. The political issues considered in Chapters VII, VIII, and IX might be easily handled in normal times. In a period requiring quick enactment of enabling legislation, formation and dissemination of sweeping policy innovations, and the establishment of new agencies and organizations, any impediments to prompt legislative action or motivations toward nonadaptive attitudes on the part of individual legislators could be disastrous. Committee assignments, and particularly committee leadership, could prove more significant even than at present. The present report sketches some of the potential problems without resolving them. Further attention to such problems by political scientists and other students of government would appear desirable under other parts of OCD's vulnerability research, its postattack research, or in research by OEP or other federal government agencies.

II FINANCIAL IMPACT OF ATTACK DAMAGE

Residential Housing, Insurance, and Banking

Perhaps the most significant financial effect from nuclear attack would be a consequence of the destruction of residential housing. In general, and particularly for a late nighttime attack, loss of housing would be correlated geographically with loss of lives. The correlation between the overall level of damage and the level of fatalities, however, would be greatly affected by availability of shelters, warning, and passive defense measures. Active defense would presumably reduce damage and fatalities somewhat equally.

No insurance is available that provides protection against attack, but the loss of housing would affect insurance companies by removing security for home mortgages. This effect would be even more important for banks, savings and loan associations, and other financial corporations. Finance companies, banks, and other institutions connected with personal and installment loans would be further affected by loss of autos and appliances, as well as loss of income to both the dead and the living. Table 1 shows the personal or installment loans and home mortgages outstanding, with a breakdown of these three types of credit by class of lender.

To pursue further the more immediate financial implications of an attack, information is needed on other forms of credit outstanding. This is supplied in part by Table 2, which shows holdings of corporate and government bonds, by type of agency issuing and type holding the securities in question.

A major factor for insurance companies is their liability under insurance outstanding. Since most life insurance is covered by war risk exclusion provisions and casualty claims are similarly protected, immediate effects of an attack relate to termination of much insurance outstanding and include elimination of some contract liabilities, immediate claims for cash surrender value, and cessation of premium income. In general, effects on life insurance would be proportional to fatalities; effects on fire insurance would be proportional to loss of housing. Table 3 provides data on insurance in force by type,--premiums, reserves, and loss experience--for assessment of these attack effects.

Table 1

**HOUSEHOLDER HOME MORTGAGES, INSTALLMENT AND SINGLE PAYMENT LOANS, AND
CHARGE ACCOUNTS**
(Billions of Dollars)

Type and Holder	1957	1958	1959	1960	1961	1962	1963	1964
Installment loans	\$ 12.84	\$ 12.78	\$ 15.23	\$ 16.67	\$ 17.01	\$ 19.01	\$ 21.61	\$ 23.94
Commercial banks	9.61	8.84	10.32	11.47	11.27	12.19	13.52	14.76
Sales finance companies	2.43	2.67	3.28	3.92	4.33	4.90	5.62	6.48
Credit unions	3.12	3.09	3.34	3.67	3.30	4.13	4.59 ^a	5.08
Consumer finance companies	1.20	1.28	1.41	1.42	1.53	1.55	1.65	1.75
Other finance	1.39	1.68	2.29	2.41	2.42	3.01	3.43	3.92
Department stores	1.21	1.13	1.23	1.11	1.08	1.07	1.09	1.15
Furniture stores	0.48	0.51	0.46	0.36	0.34	0.35	0.33	0.37
Auto dealers	1.59	1.47	1.68	1.74	1.77	1.82	1.91	1.96
Other retailers								
Subtotal	\$ 33.87	\$ 33.64	\$ 39.25	\$ 42.83	\$ 43.53	\$ 48.03	\$ 53.75	\$ 59.39
Single payment loans and charge accounts								
Commercial banks	2.94	3.16	3.58	3.88	4.41	4.69	5.06	5.47
Other finance	0.43	0.47	0.55	0.62	0.72	0.77	0.91	1.00
Department stores	0.88	0.91	0.96	0.94	0.95	0.93	0.90	0.91
Other retailers	3.96	3.81	3.75	3.95	3.91	4.25	4.46	4.76
Credit cards	0.32	0.35	0.34	0.44	0.47	0.51	0.52	0.64
Service credit	2.59	2.80	3.08	3.36	3.69	3.99	4.32	4.64
Subtotal	\$ 11.10	\$ 11.49	\$ 12.30	\$ 13.20	\$ 14.15	\$ 15.13	\$ 16.15	\$ 17.41
One to four family home mortgages								
Mutual savings and commercial banks	30.50	33.27	36.09	37.61	40.08	44.28	49.63	54.61
Savings associations	36.00	42.89	49.54	55.39	62.40	69.78	79.08	87.04
Life insurance companies	21.44	22.37	23.58	24.90	25.78	26.40	27.33	28.71
Federal government agencies	4.69	4.66	6.26	7.14	7.31	7.36	6.17	6.00
Individuals and other	13.00	14.49	15.39	16.28	17.54	18.69	20.00	21.22
Subtotal	\$107.62	\$117.69	\$130.85	\$141.29	\$153.08	\$166.48	\$182.19	\$197.58
Total	152.59	162.62	182.40	197.32	210.76	229.65	252.08	274.39

Note: Detail may not add due to rounding.

Sources: Business Statistics, 1965, pp. 92-3. Savings and Home Loan Financing Source Book, 1965, Federal Home Loan Bank Branch.

Table 2

GOVERNMENT AND CORPORATE DEBT, BY HOLDERS
1962
(Billions of Dollars)

Holders	Issuers									
	Federal Government	State and Local Governments	Banks	Insurance	Other Finance	Total Finance	Manufacturing	Utilities	Other	Total Corporate
U.S. Government & Federal Reserve banks	\$ 87	\$	\$	\$	\$	\$	\$	\$	\$	\$
State & local governments	20									
Foreign & miscellaneous	17									
Banks	72	19	--	--	(4)*	(4)	(3)	(3)	(2)	12
Insurance	12	13	--	--	(25)	(25)	(15)	(24)	(13)	77
Other finance	9	1	--	--	(13)	(13)	(11)	(14)	(9)	47
Total finance	\$ 93	\$ 33	\$ --	\$ --	\$ (42)	\$ (42)	\$ (29)	\$ (41)	\$ (24)	\$ 136
Manufacturing	11	1	--	--	(12)	(12)	(8)	(11)	(7)	38
Utilities	4		--	--	(4)	(4)	(3)	(3)	(2)	12
Other industry	2		--	--	(6)	(6)	(4)	(5)	(3)	18
Total nonfinance	\$ 17	\$ 2	\$ --	\$ --	\$ (22)	\$ (22)	\$ (15)	\$ (19)	\$ (12)	\$ 68
Total corporate	110	35	--	--	(64)	(64)	(44)	(60)	(36)	204
Private individuals	66	27	(1)	(1)	(2)	(4)	(2)	(4)	(2)	12
Total outstanding	300	62	1	1	66	68	46	64	38	216

Note: Accounts payable or receivable have been excluded along with reserves of insurance companies against claims and bank deposits. The debt totals thus correspond to the funded debt.

* Figures in parentheses are calculated by prorating marginal totals and are given only as illustration of possible detail breakdowns.

Sources: U.S. Treasury Bulletin, 1967, for 1962 data on holders of government issues. Corporation Income Tax Returns, July 1961-June 1962 for corporate holdings and issues. Data used were Investments Government Securities for government holdings, the sum of other current assets including short term marketable securities and other investments for holdings of corporate debt, and the sum of bonds, notes, mortgages payable maturing in less than one year plus those maturing in more than one year for debt outstanding.

Table 3
INSURANCE IN FORCE, PREMIUMS, AND LOSS EXPERIENCE
1965
(Billions of Dollars)

	<u>In Force</u>	<u>Premiums</u>	<u>Losses</u>	<u>Reserves</u>
Property insurance*	\$ n.a.	\$29.1	\$20.8	\$28.6*
Fire and homeowners		3.6	2.3	
Auto		8.4	5.2	
Workman's compensation		2.3	1.4	
Health insurance		11.0	9.2	
Marine fidelity, surety		1.2	0.7	
Other property		2.7	1.9	
Ordinary life	504.4	11.1	2.6	76.9
Group life	337.1	2.8	1.8	2.0
Industrial life	<u>40.8</u>	<u>1.3</u>	0.4	11.9
Total	\$882.3	\$15.1	4.8	90.1

* Reserves against property insurance amounted to \$28.6 billion in 1962. Reserves thus approximate annual premiums and exceed losses with a small safety factor. Policy holders surplus was \$17.4 billion in 1965, an increase of \$3.5 billion over 1962.

Sources: The Spectator, November 1966. Insurance Facts 1966. 1967
 Life Insurance Fact Book.

A major liability of the banking system is the level of current deposits. Savings and demand deposits both constitute an immediate problem under present practice of honoring savings deposits. In the absence of a general bank moratorium, time deposits--whether evidenced by certificates of deposit or not--are not so immediate. Table 4 depicts the current deposit situation in the banking system.

Corporations

Table 5 contains general information on the assets and liabilities of U.S. corporations. Among the assets, those subject to risk through immediate attack effects would be the physical assets, including inventories and depreciable assets and possibly exposed currency. Paper evidences of debt might be lost, but in general could be replaced. The obligations or values represented by such financial instruments would be subject to loss through bankruptcy or default of the issuing entity or to loss of market value. Cash includes bank deposits that would be subject to the risks of federal action blocking or restricting withdrawals or to bank failure. Accounts receivable (or, on the liability side, accounts payable) would be subject to the adversities of the postattack economy.

As indicated in Table 5, net worth of manufacturing corporations tends to equal their physical assets so capital and surplus accounts would adequately cover the financial losses from direct attack effects. From a balance sheet standpoint, damage would result in a loss of stockholders' equity, but would not remove security for bonded indebtedness or bankrupt the average corporation. Indirect effects of problems arising in the financial sectors of the economy could be significant, however.

Losses of Assets

Table 6 shows the loss of physical assets that might occur in two different hypothetical attacks--(1) an attack that destroyed all SMSAs and a counterforce attack that destroyed half of a limited number of SMSAs adjacent to military targets or port cities. These examples are introduced to provide the basis for first estimates of the possible range of primary financial effects and some secondary financial consequences of the primary losses. In the preparation of Table 6, it was assumed for each industry that damage to physical assets was proportional to preattack value added in the SMSAs attacked. Loss of residential housing was assumed to be proportional to fatalities as computed under the assumption of no warning and no passive defense.

Table 4
U.S. BANK DEPOSITS AND OTHER LIABILITIES
1950-1964
(Billions of Dollars)

	1950	1957	1958	1959	1960	1962	1963	1964
Deposits of individuals, partner- ships and corporations								
Demand	\$ 91.3	\$110.1	\$115.7	\$116.5	\$117.4	\$125.0	\$125.4	\$135.7
Time	55.2	85.4	94.0	97.8	103.4	132.6	147.6	116.6
U.S. government and postal savings	3.1	4.3	4.7	5.4	6.2	7.1	7.0	6.8
Deposits of states and subdivi- sions	9.5	13.7	14.7	14.7	16.4	18.7	20.3	23.3
Deposits of banks	14.0	17.0	18.2	17.1	18.9	16.6	15.8	18.8
Other deposits (certified and cashiers' checks, etc.)								
Subtotal	2.9	3.6	4.0	3.9	4.6	4.5	4.5	6.0
	\$176.1	\$234.1	\$251.3	\$255.5	\$266.9	\$304.6	\$320.7	\$307.1
Liabilities	2.2	4.5	4.7	5.9	7.4	10.6	13.0	12.8
Total	\$178.3	\$238.7	\$256.0	\$261.4	\$274.3	\$316.2	\$333.7	\$320.0

Source: Statistical Abstract of the United States, 1965 and prior years.

Table 5

ASSETS AND LIABILITIES OF U.S. CORPORATIONS
1957-58 and 1961-62
(Billions of Dollars)

	Manufacturing		Public Utilities		Finance		Other		Total	
	1957-58	1961-62	1957-58	1961-62	1957-58	1961-62	1957-58	1961-62	1957-58	1961-62
Assets										
Cash	\$ 15.2	\$ 16.1	\$ 3.7	\$ 3.9	\$ 59.2	\$ 63.4	\$ 11.2	\$ 13.6	\$ 89.2	\$ 102.0
Receivables	38.1	53.6	5.3	9.0	125.2	166.8	33.6	44.8	202.2	274.3
Government bonds	11.2	12.5	2.9	3.6	104.6	126.0	2.9	2.7	121.6	144.8
Mortgages	0.1	0.2	0	0	93.2	141.1	0.2	0.6	93.6	142.4
Other investments	22.3	33.1	6.3	8.7	103.2	133.6	11.0	15.0	142.8	190.5
Tangible and de- preciable assets	138.1	180.4	103.2	130.3	43.0	63.3	62.7	81.7	347.0	435.7
Total	\$224.9	\$276.0	\$121.3	\$155.5	\$528.5	\$699.9	\$121.7	\$158.1	\$996.4	\$1,289.5
Liabilities										
Payables	19.8	45.8	4.1	12.8	10.9	19.4	20.0	37.9	54.8	115.8
Contingent liabil- ities	21.2	7.9	8.1	4.1	397.3	504.7	12.2	7.0	438.8	523.8
Debt	37.7	45.7	48.1	63.9	46.6	67.8	26.0	38.3	158.4	215.7
Net worth	146.3	176.5	61.0	74.7	73.7	108.0	63.4	75.0	344.4	434.2
Total	\$224.9	\$276.0	\$121.3	\$155.5	\$528.5	\$699.9	\$121.7	\$158.1	\$996.4	\$1,289.5

Source: Corporate Income Tax Returns, July 1957 to June 1958 and July 1961 to June 1962.

Table 6

POSSIBLE LOSS OF PHYSICAL ASSETS FROM ATTACK
(Dollars in Billions)

	U.S. Total 1962	Percent in Counterforce SMSAs	Percent in All SMSAs	Possible Losses	
				From Light Counterforce Attack*	From Heavy SMSA Attack
Inventories	\$ 95	31%	79%	\$ 15	\$ 75
Depreciable assets	279	31	79	43	221
Housing	596	19	63	57	378
Total	\$970			\$115	\$674

* Estimated losses from light counterforce attack were calculated on the assumption that half the value at risk in the SMSAs would be affected by the counterforce attack. The percentages in the SMSAs are estimated from the distribution of value added, population, and housing.

Sources: Corporate Income Tax Returns, 1961-1962. Value of housing estimated from mortgage debt on housing from Table 1 multiplied by the ratio of mortgage value to value of mortgaged residences taken from Statistical Abstracts—1967 (data based on 1960 Census of Housing) and divided by percentage of number of houses having mortgages (figures given in Statistical Abstracts, 1967), Figures in sequence named were

$$186.5 \left(\frac{220}{108} \right) / .568 = 596$$

Table 7 shows the effects of the losses in Table 6 on corporate assets and liabilities. Reduction of life and fire insurance outstanding was assumed to be proportional to fatalities. Loss of mortgage security was prorated among mortgage holding groups. Even in the case of the extreme attack, insolvency would not necessarily be widespread. Loss of net worth and hence equity should depress the real value of stocks and reduce the net worth of mutual funds and private investors. Loss of housing would destroy owners' equity as well as mortgage security. These effects would be reflected in changes in the financial position of the private sector.

Vulnerable Financial Sectors

The following sectors of the economy present the primary fiscal problems:

1. Utilities including transportation, electric power, and communications
2. Insurance
3. Mutual funds
4. Banks and savings and loan associations
5. Finance and small loan agencies
6. Federal, state, and local governments
7. Private individuals

In the case of utilities, the large ratio of bonded debt to net worth or equity capital could threaten individual companies--particularly those suffering larger than average losses. Subsequent loss of income from loss of subscribers, areas, or customers could compound the difficulties associated with loss of assets.

The situation for life insurance companies is confused but somewhat unfavorable. Although war risk exclusion clauses would save the life companies from claims for death benefits, cash surrender values of policies terminated by death could require substantial outlays. Cash surrender payments in 1965 totalled \$2.5 billion on terminations of 5 percent of policies outstanding. In the case of the counterforce attack, fatalities could force termination of 10 percent of the policies, and,

Table 7

EFFECTS OF POSSIBLE ATTACK LOSSES ON CORPORATE ASSETS AND LIABILITIES
(Billions of Dollars)

	<u>Manufac- turing</u>	<u>Public Utilities Including Transport</u>	<u>Finance</u>	<u>Other</u>	<u>Total</u>
Assets					
Reproducible	\$ 160	\$ 130	\$ 63	\$ 82	\$ 436
Receivables	54	9	167	45	274
Mortgages	0	—	142	1	142
Other	62	16	378	31	437
Total	276	155	\$ 700	\$158	\$1,289
Contingent liabilities	8	4	505	7	524
Payables	46	13	19	38	116
Net worth preattack	177	75	108	75	434
Losses from counterforce					
15% reproducibles	-24	-20	-9	-16	-69
10% receivables	-5	-1	-17	-4	-27
9% mortgages			-13	—	-13
Cash surrender payments			-5		-5
Gain from reduction in insurance reserves			+12		+12
Net worth after counterforce attack	\$ 148	\$ 54	\$ 78	\$ 56	\$ 332
Losses from heavy attack					
79% reproducibles	-128	-104	-51	-65	-348
79% receivables	-43	-7	-133	-36	-219
63% mortgages	—	—	-113	—	-113
Gain from reduction in insurance reserves					
Property			+13		+13
Life			+60		+60
Cash surrender payment (life)			-33		-33
Net worth after heavy attack	\$ +6	\$ -36	\$-149	\$-26	\$ -205

Note: Of the \$123 billion loss in mortgage default, \$44 billion would be held by Savings and Loan Associations, and only 69 billion by other financial corporations.

if cash values remained in proportion to experience, an additional \$5 billion would become payable. If, as in current experience, voluntary termination rates tend to be higher for new policies, cash values on the average policy probably exceeds the experienced ratio (which would show only \$50 billion in cash values for the \$504 billion dollars of ordinary life in force). Reduction in policies in force would presumably reduce the required reserves. If these reductions were also in proportion to insurance in force, a reduction of liabilities of 10 percent of 1965 life insurance reserves of \$91 billion would release \$9 billion, which would more than compensate for the surrender payments. Any suspicion of insolvency leading to terminations by survivors and lump sum payments demanded under contingent beneficiary annuity contracts could disturb the liquidity although not necessarily the solvency of the life companies. Losses through mortgage defaults might wipe out \$6 billion in assets. The net effect of losses cited would be a loss of \$2 billion, which would exceed the \$1.5 billion in capital stock of the stock companies but not their safety reserve. Defaults on policy loans would also occur but these would be covered for the most part by cash surrender values already considered.

The heavy attack would greatly magnify these effects. A 63 percent reduction in insurance in force could produce a 13-fold increase of terminations over normal experience, increasing cash surrender payouts by \$33 billion while freeing reserves of \$60 billion. The apparent gain of \$27 billion would be more than offset by possible losses of \$42 billion from mortgage defaults plus other losses of assets from such causes as defaults on corporate bonds. Some type of government intervention either through a partial moratorium, financial aid, or controlled liquidation and reorganization would be essential. The net deficits, however, would be small in comparison with the total insurance in force.

Mutual funds would be at the mercy of the security market, which would be violently depressed initially because of losses and income uncertainty. Banks and loan companies would also suffer from loss of mortgage assets and these could not be matched against any reduction in deposit liability in the absence of government intervention. Finance companies and small loan agencies would suffer from loss of autos and other installment securities, and together with the banking system, would suffer from loss of income to or death of borrowers.

Governments at all levels would suffer from destruction of government-owned facilities and from loss of tax base and would experience an immediate need for funds for a wide variety of public works activities. Percentage losses of major revenue producing taxes would be those derivable from the dollar figures given in Table 8, if no change in tax rates were initiated.

Table 8

TAX REVENUES AND POSSIBLE EFFECTS OF ATTACK ON TAXES
(Billions of Dollars)

	1965		Taxes After Counterforce Attack		Taxes After SMSA Attack	
	State & Local		State & Local		State & Local	
	Federal	Local	Federal	Local	Federal	Local
Personal taxes						
Income taxes	\$ 56.4	\$ 4.4	\$45.0	\$ 3.5	\$11.3	\$ 0.9
Estate (death) and gift	2.8	0.8	25.2	7.0	7.2	2.0
Motor vehicle licenses	—	1.0	—	0.8	—	0.2
Property tax	—	0.8	—	0.6	—	0.2
Other taxes	—	0.3	—	0.3	—	—
Nontaxes	-0.05	4.5	—	3.6	—	1.0
Less refunds	-5.1	—	-4.0	—	-1.0	—
Subtotal	\$ 54.2	\$11.8	\$66.2	\$16.7	\$17.5	\$ 4.3
Corporate profits, tax accruals	29.1	2.0	26.3	1.6	5.8	0.4
Indirect Business Tax and nontax accruals						
Sales or Excise						
General	—	7.3	—	5.8	—	1.5
Gasoline	—	4.5	—	3.6	—	0.5
Liquor	3.8	0.9	3.0	0.7	0.8	0.2
Tobacco	2.1	1.4	1.7	1.1	0.4	0.3
Other	8.4	—	6.8	—	1.7	—
Local sales	—	1.7	—	1.4	—	0.3
Customs duties	1.7	—	1.4	—	—	—
Motor vehicle licenses	—	1.0	—	0.8	—	0.2
Property taxes	—	23.1	—	18.5	—	4.6
Other taxes	—	4.6	—	3.7	—	0.9
Nontaxes	1.1	1.3	0.9	1.0	0.3	0.3
Less refunds	0.3	—	0.3	—	—	—
Subtotal	\$ 16.8	\$45.8	\$13.5	\$36.6	\$ 3.2	\$ 8.8
Contributions for social insurance	24.8	4.5	19.8	3.6	5.0	0.9
Federal grants-in-aid	—	11.2	—	—	—	—
Total	\$124.9	\$75.3	\$81.8	\$48.5	\$31.5	\$14.4

Source: U.S. Department of Commerce/Office of Business Economics, The National Income and Product Accounts of the United States, 1929-65.

Private individuals would suffer from loss of homes, personal possessions, mortgage defaults on loans extended to one another, changes in market value of securities, and from possible loss of income. Because of increased government obligations, they would also face probable increases in tax rates and cost of living.

Uncertainties in such analysis are extremely great. The security market in particular would depend on the whole outlook for economic viability, considering government actions with respect to public works and rehabilitation assistance generally, inflation control, financial and economic stabilization, and the prospects for profits and employment. The chief objective of the present analysis, however, is to establish general facts relevant to the ownership of surviving property. The value of such property in the aggregate will depend on its presumed capacity for producing income, but the value itself is of secondary interest. The question of ownership is significant here only in assessing its implications relevant to the structure and organization of society and in assessing possible secondary effects on productivity.

The problems of concern are the effects of general financial losses on the ability of corporations and individuals to meet outstanding obligations and their ability to persuade others of their ability to perform under new commitments. If a major attack concentrated part of its force on gasoline refining and if other losses of transportation and communications capacity restricted free movement of people and information, stresses could arise in the whole credit structure. These, combined with uncertainty as to the ownership of surviving facilities, could threaten the free enterprise institutions of private property, credit, and contract and thus contribute further to an unnecessarily stringent regionalization of economic life. The effects of such institutional factors in lowering productivity provide the primary emphasis of the present analysis.

Credit arrangements nationally are concerned with consumer credit and the status of individuals, but also--and more significantly--with the status of business and corporations. Loss of credit assurance, loss of possible effectiveness of the courts, and the lessening of general social pressures with respect to credit commitments could contribute even more uncertainty to business affairs than physical and technical problems. The primary need is either to establish a procedure for rapidly determining the financial incidence of attack losses, providing relief for cases of undue hardship and implementing any policies for loss equalization or to devise some procedure for divorcing and insulating the ongoing economy from the past. One possibility--undoubtedly more drastic than seems necessary but preserving the forms of our economic system--could begin with federal seizure of all productive facilities for immediate resale to corporations formed and capitalized especially to operate those facilities,

with the proceeds of sale impounded by the government, pending resolution of the problems of equitable redistribution. There are other less sweeping proposals, but all would probably include some degree of government intervention.

Credit arrangements for individual consumers are more significant to local than national markets, and their importance would be greatly reduced by a lack of autos, appliances, and other consumer durables for purchase. The national credit card systems would probably undergo considerable change and might become contingent on or tied in with business affiliation (as now tends to be the case for travel and telephone credit cards), rather than retaining the individualized basis now characteristic of gasoline and general purpose credit cards. Marked reduction in travel, rationing problems, and other changes in the social environment could make continuation of national credit card systems unprofitable because of increased risk and decreased activity. None of these changes, however, would play a major role in investment financing.

Business credit, particularly clearing procedures for checks and bank drafts, would have much greater significance. The probable wave of "fly-by-night" operators who would attempt to profit from special opportunities generated by the emergency conditions; the need to find new vendors or distributors to replace those cut off or defunct; uncertain solvency of even old, well-established companies; and congested courts would all discourage easy acceptance of promises to pay. Even in normal times, interbusiness extension of credit is more cautious than extension of many types of consumer credit--partly because of the larger sums involved in each transaction, the greater losses in case of business failures, and the greater pressures that can be exerted for collection of personal accounts. Reliable figures on interbusiness credit transactions are not readily available, but some parameters that indicate general magnitudes of interbusiness credit and clearing activities are shown in Table 9. Bank debits and deposit turnover rates in Table 9 include personal transactions, but total debits indicate upper limits on the various types of business transactions.

Contracts

If postattack conditions would not be conducive to normal credit flow and would disturb the normal basis for mutual trust; if property rights and ownership would be questionable; and if conditions and government actions would provide obstacles to performance of contract services (or excuses for nonperformance), the whole institution of contracts could be jeopardized. To analyze such possibilities at least one step further,

Table 9

BANK DEBITS AND DEPOSIT TURNOVER

	1958	1959	1960	1961	1962	1963	1964
Debits to demand deposits (billions of dollars per year)							
New York	\$ 959	\$1,024	\$1,103	\$1,279	\$1,416	\$1,556	\$1,736
Boston, Philadelphia, Chicago, Detroit,							
San Francisco, and Los Angeles	487	545	578	623	702	776	842
337 other centers	994	1,110	1,158	1,210	1,319	1,423	1,563
Total	\$2,440	\$2,679	\$2,839	\$3,111	\$3,436	\$3,755	\$4,141

Annual rate of turnover of demand deposits (ratios of annual debits to average amount of deposits)

New York	53.6	56.4	60.0	70.0	77.8	84.8	93.8
Boston, Philadelphia, Chicago, Detroit,							
San Francisco, and Los Angeles	30.0	32.5	34.8	36.0	41.2	49.6	47.8
337 other centers	22.9	24.5	25.7	26.2	27.7	29.0	30.8

Source: Board of Governors of the Federal Reserve System, annual and current reports on bank debits and Federal Reserve Bulletin

consider the prospects for continuing present practice with respect to the most important contract types:

1. Insurance
2. Construction
3. Options
4. Installment
5. Employment, wage, or union
6. Trusts and annuities
7. Delivery or other terms of sale
8. Subcontracts
9. Repair and maintenance
10. Other service

The most significant of these for business are construction contracts or contract awards, wage contracts, sales contracts, subcontracts, and business service contracts.

Table 10 gives some rough figures on the number and monetary value of various types of identifiable contract agreements or awards made during 1963. Among these, only a small portion of the service contracts could conceivably be fulfilled if an attack denied materials, skilled labor, or subcontract assistance or if it destroyed relevant facilities. The actual fraction of contracts that might be fulfilled would depend on the extent of damage, but nonperformance might be the rule after the SMSA attack. Court judgments could scarcely keep up with the wave of cases even if procedures were remarkably streamlined, and precedents would undoubtedly arise to circumvent judicial redress for nonperformance. Under such circumstances, criteria of plausibility would enter contract negotiations to an unprecedented extent and would greatly constrain the types of agreements entered into. The problem, however, is whether business operations could survive such constraints or could somehow proceed without performance guarantees or performance assurance. Services could be provided without contract, and labor could be performed without ironclad wage agreements, but interbusiness transactions would require at least some evidence of good faith or the intervention of trusted (probably governmental) intermediaries.

Table 10
ESTIMATED CONTRACT ACTIVITY

Class of Contract*	Estimated Number of Contracts (millions)	
	In Force	Negotiated Each Year
Residential construction†	1	1
Life insurance policies‡	75	25
Property or casualty insurance policies§	120	80
Installment**	100	50
Service††	50	50
Business (sub)‡‡	100	100

* Since life insurance and property or casualty insurance contracts are self-terminating and installment contracts involve a credit problem only, residential construction, service, and business (sub)contracts alone can entail serious nonperformance problems. The estimates here merely indicate that the business subcontracts are probably the most significant. Incidentally, among 68,000 cases brought before U.S. District Courts in 1965, over 16,000 concerned contract actions.

† Estimates are based on number of housing units covered by building permits, including 0.7 million single family residences, 0.05 million double family residences, 0.05 million units in three- or four-family structures, 0.5 million units in five-or-more family apartments, and 0.03 million units for public housing.

‡ Estimates are based on number of policies in force and number written each year.

§ Number of policies are estimated from annual premiums written.

** Number of installment contracts are estimated from credit outstanding, including \$25 billion in auto coverage for perhaps 13 million contracts, \$19 billion in consumer goods for perhaps 40 million contracts, and \$22 billion in personal loans for perhaps 40 million contracts. Sales figures include 9 million new autos and 35 million major appliances.

†† The number of service contracts outstanding can only be guessed. There are about 1 million service establishments of which only about one-seventh (primarily those engaged in miscellaneous business services) are likely to operate on service contracts.

‡‡ The value of defense prime contracts in excess of \$10,000 has averaged over \$27 billion for 1963-65. The number of such prime contracts would fall in the 1 to 3 million range if average size falls on the range from \$10,000 to \$30,000. Subcontracts should exceed the number of prime contracts by one or two orders of magnitude.

Contracts entered into before the attack could make no sense after the attack, and discontinuance might be to the best interests of all parties. This would be true of most construction contracts, particularly public works contracts. Construction would be needed more than ever, but roads, dams, and many other particular projects with some degree of urgency preattack might have little or no priority compared with the more immediate requirements for highway and railroad bypasses, replacement of essential network links, debris removal, emergency housing, sanitation and utility projects, and other tasks essential to survival. Some of the special expertise needed for the more sophisticated preattack work might not be necessary for the more rudimentary jobs, but the need for skilled persons would generally be great and civil or construction engineers could easily be absorbed in managerial and executive assignments. The process of settlement of open contracts and renegotiation of new ones might be rather complex and would require considerable attention from business management and public administrators.

A large part of the value added in manufacturing is contributed by subcontract work from many small establishments producing special parts, components, and subassemblies. Many of these are located around large centers of industry (e.g., Los Angeles, Detroit, Seattle, San Francisco, Chicago, St. Louis, Cincinnati, Cleveland, Pittsburgh and the Northeast Corridor) and cater to the needs of major prime contractor industries (e.g., aerospace, automotive equipment, electronics). In spite of the tendency for these to cluster around their major customers, the task of negotiating appropriate subcontracts with reliable vendors is a large part of the procurement efforts of large manufacturing corporations, and a large number of manufacturers' representatives act as finders or brokers engaged in negotiations for subcontracting or supplying parts and materials.

The effects that the attack would have on this brokering activity will be discussed further in Chapter IV, but considerable effort would be required to terminate existing subcontracts and find suitable parties for new ones appropriate for then current manufacturing emphasis. The number of new subcontracts or other interbusiness agreements would be unprecedented. Although many of these would involve vendors only in the proximity of the major manufacturers, a substantial portion would be in other locations. Data on the aerospace industry, for example, indicate that 40 to 60 percent of aerospace R&D prime contracts entail purchases from vendors outside the SMSA of the prime contractor although these purchases represent only 10 to 20 percent of the prime contract billings. Existing procedures for establishing the financial and technical reliability of such vendors or subcontractors facilitate a normal stream of subcontract agreements. The fiscal and technical uncertainties of all operations in the postattack period would greatly complicate all such negotiations.

III MANAGEMENT IMPACT OF ATTACK LOSSES

Corporations

The confused financial status of U.S. corporations that would prevail immediately after an attack has already been mentioned. The status of individual establishments and divisions of such corporations would be even more confused. Table 11 shows the number of individual branches of the 25 largest U.S. industrial corporations in each of the major census regions. Some corporations are extremely decentralized and permit autonomous operation of corporate divisions and even individual plants. Some, however, have centralized accounting systems, including centralized preparation of payroll checks and general disbursements. Circumstances could force a much greater decentralization of authority and even require local plant management to assume responsibility for financial, budgetary, and control functions as well as details of procurement, contract negotiation, shipping and receiving, billing, and disbursement. In case of a poorly functioning national banking system, local arrangements for payrolls and for collection of accounts receivable might be desirable if not essential.

Some corporations are decentralized only on a regional, divisional, or product line basis. The need for local autonomy could still exist among plants of such corporations, but the circumstances and the need could vary from region to region or division to division. In some cases, the interdependence of plants may cross regional or divisional lines, particularly for the integrated industries. Problems of coordination could become important for such regionalized but integrated corporations, and perhaps even for others.

Throughout all corporations, circumstances would require thorough re-examination of plans, policies, aims, and objectives. The large corporations have plans for management succession similar to those for government. The new management team, however it is made up, would find itself confronted with new problems for which precedent as indicated by company records may be of little assistance. In many cases relevant records might be lost, and knowledgeable personnel might not have survived.

Plans for succession of corporate officers have tended to emphasize the corporate headquarters level. Relatively few corporations have extended planning for succession to cover divisions and individual plants in detail. This fact could present problems if plant activities had to

Table

PLANTS OF THE 25 LARGEST U
1963

Corporation	New England	Mid- Atlantic	East N. Central	West N. Central
General Motors	4	18	76	6
Standard Oil of New Jersey	1	3	0	0
Ford Motor	0	11	41	5
General Electric	27	47	60	2
Socony Mobil Oil	1	6	4	1
U.S. Steel	2	22	15	9
Texaco	0	1	2	1
Gulf Oil	0	1	2	0
Westinghouse Electric (New York)	1	4	3	2
Swift (Chicago)	5	14	25	37
Du Pont	3	21	15	4
Chrysler	0	3	35	1
Standard Oil of California	1	5	5	3
Standard Oil of Indiana	0	0	5	3
Bethlehem Steel	1	17	3	2
Shell Oil	1	1	2	0
Westinghouse Electric (Pittsburgh)	3	36	7	0
IBM	2	6	1	0
General Dynamics	7	26	56	14
Armour	3	8	12	38
International Harvesters	0	0	11	0
National Dairy Products	10	51	46	24
Boeing Aircraft Company	0	1	0	1
Lockheed	0	2	0	0
RCA	2	13	8	0
Total	74	317	434	153

Table 11

25 LARGEST U.S. CORPORATIONS, BY REGION
1963-64

<u>West N. Central</u>	<u>South Atlantic</u>	<u>East S. Central</u>	<u>West S. Central</u>	<u>Moun- tain</u>	<u>Pacific</u>	<u>Total</u>
6	6	0	2	0	6	118
0	2	0	3	1	0	10
5	1	3	1	0	5	67
2	14	15	4	2	8	179
1	0	0	3	1	1	20
9	1	8	5	3	10	75
1	0	0	4	1	2	11
0	0	0	1	0	0	4
2	2	0	1	0	0	13
37	38	25	31	8	12	195
4	21	11	7	1	3	86
1	2	1	0	0	1	43
3	7	6	7	9	30	73
3	3	0	3	2	0	16
2	10	0	1	0	7	41
0	0	1	21	1	12	39
0	9	4	2	0	1	62
0	1	1	1	0	2	14
14	13	11	16	9	25	177
38	16	17	16	1	5	116
0	0	2	1	0	2	16
24	27	23	9	10	5	205
1	0	0	0	0	3	5
0	1	0	0	0	7	10
0	1	0	0	1	4	49
153	175	128	139	50	154	1,624

be drastically altered, particularly if difficulties with communications and transportation would make corporate level planning and counseling services inaccessible.

In the absence of comparable historical experience, the vulnerability of organizational and institutional arrangements to attack-induced effects can only be inferred through an attempt to project corporate and other business practices into a probable postattack environment. Although such projection leaves many details open for conjecture (or for scenarios), broad features of the extrapolation emerge with greater clarity and permit some degree of prophecy. Whether such prophecies would prove to be accurate in detail or even in general tenor, they are useful in identifying possible sources of institutional vulnerability. Countermeasures could reduce the potential or the likelihood of these problems. Postattack research could further analyze their significance. With these objectives in mind, the following paragraphs collect impressions of the state of affairs that would be likely to confront business management.

Demand would be quite different from that preattack, even if no major military operations were in progress, since the rehabilitation requirements of the civilian economy would be paramount. Luxury items would hold little interest, and products (e.g., automobiles) once considered necessities might be overstocked and useless (e.g., if gasoline is lacking). The greatest demand could be for producers' goods, construction equipment, and other products of the larger SMSAs, which would have sustained the greatest damage. The new managements of business and industry would be confronted with the problems of reorienting the activity of their whole plant complex.

Productivity would depend heavily on the ability of government and industry to reschedule ongoing activities to accommodate the need for economic rehabilitation and to adjust for uncertainties and difficulties. The relatively inexperienced persons that would succeed to the executive posts at various echelons of industry would be faced with the most delicate and extensive scheduling problems ever encountered. Production workers would be inexperienced, marginal workers would be added to the labor force, deliveries would be uncertain, and production machinery would be in poor condition and difficult to repair or replace. Government intervention would be so extensive that it would seem to be omnipresent and government controls, allocations, priority systems, and economic stabilization activity would add additional paper work to most business transactions.

Another aspect of business life would be the unprecedented need for intercorporate cooperation. In view of the sweeping changes in demand,

many corporations would find themselves in virtually new businesses for which many of their plant facilities and their particular organizational structure might prove quite inappropriate. Mergers or wholesale redistribution of plants and other facilities among different corporations might prove desirable or essential. This would particularly be so if there were a need to regionalize the whole country into more self-sufficient geographical areas. Combinations of products and activities that have developed in the evolution of particular corporations might not fit postattack circumstances. Plants whose products are no longer of interest might be converted to provide support for some industry or corporate line different from those into which the owning corporation might be evolving. An unusual number of facility exchanges could occur if fiscal problems and government policies did not impede transfer.

Such changes would drastically affect the balance of corporate work force at all levels. Workers at particular plants might not be trained for the activities in which the plants would be engaged. Transportation difficulties might discourage long moves on the part of workers, both from their personal standpoint and from considerations of general welfare. Reduced mobility and general shortages of skilled workers could create great manpower control problems. Intercorporate shifts of workers could be very extensive in large centers and should perhaps be encouraged, but probably should be controlled to forestall increased instability.

Studies concerned with national survival have tended to assume, explicitly or implicitly, that all available facilities would be fully utilized at maximum capacity postattack. Such an assumption is obviously unrealistic. Loss of productivity and hence underutilization would arise from bottlenecks, lack of skilled labor, shipping delays, and possibly fuel shortages. Even more significantly, some facilities might not prove adaptable to changed demand. Survival studies, moreover, tend to base any estimates of capacity on preattack uses of facilities and preattack product mixes. Since these facilities were designed to be efficient for preattack operations, they would be unlikely to prove as efficient for other operations.

Questions of ownership would also be important. For example, integrated operations in a normally integrated industry might not occur, even if adequate facilities survived, if ownership were divided among several corporations. Government intervention might resolve such problems and probably would, but the necessary actions might exceed the authority normally granted the state or federal governments. Less obvious problems would arise from subcontracting requirements and the need to schedule the activities of many different companies in an integrated fashion. Government action could again be the answer, but would require unprecedented

intervention that industry would be ill-prepared to accept and new functions that government is ill-prepared to perform.

Anything like full utilization of surviving facilities would require careful scheduling of large complexes of widely scattered plants and careful control of interplant flows. This would be true because attack damage would destroy much of the flexibility and richness of alternatives that characterize the present economy. No programming methodology exists that could handle such a scheduling operation adequately.

The federal, state, and local governments are poorly equipped to cope with the kind of detail that would be pertinent. Moreover, neither a complete laissez-faire economy nor a meticulously planned totalitarian economy could provide the machinery for well-oriented and efficient integration. The implications of such observations are: (1) that full capacity utilization (with capacity defined in a manner consonant with post-attack needs) could not be achieved and (2) that a serious effort to achieve a fair degree of utilization would require methods that combine and compromise among conflicting advantages and disadvantages of alternative systems of national economic organization.

Government

Once immediate survival needs were provided for, rehabilitation and reconstruction projects would have the greatest urgency. These would include highway repair and repairs to rail and communication nets that would greatly exceed the capabilities and financial resources of the utility corporations. The problem to be faced at this juncture would be essentially one of planning a "massive program of public works" projects in the most austere and efficient manner possible without interfering unduly with industrial capacity essential for and adaptable to production that would sustain life or that would support growth of capacity for doing so. The management of the works program would most appropriately be done by the federal government since it would relate to general survival. The unprecedented pace and scale of the effort that would probably be required (e.g., exceeding in magnitude the total effort of World War II compressed into a few months) would overwhelm any central recovery planning agency responsible for more than top level coordination. In such a situation, even a totalitarian regime would have to rely heavily on local management and a democratic government would naturally be even more likely to do so. It would not be easy to devise suitable methods for adequate coordination of widely diverse and localized efforts. As yet, no adequate mechanism has been suggested for achieving team-like interaction among local, state, and federal governments; their various agencies; and the local, regional,

and general management of business. This might be the major task of government and business policy-makers.

This task could be handled in many different ways, but the ways most consonant with American values would lie between possible extremes and would represent the result of some attempt to balance the dangers of uncoordinated entrepreneurial opportunism with those of risky and inflexible adherence to a detailed national plan.

The vulnerability of the U.S. economy to organizational arrangements lies in the need for new organizations to deal with new planning problems. To illustrate the general character of a conceivable rehabilitation program, a ten-phase program will be set down as a basis for possible discussion. The phases might appear to be steps in a master plan but are more accurately presented as overlapping phases initiated successively (in the sequence listed), with the description of each phase reflecting its dominant emphasis rather than its complete specifications. This sequence will be discussed further in Chapter V, but is presented here to indicate some of the novel management problems that could arise and possible solutions to them. The program phases are:

1. Locate, sequester, count, or weigh surviving inventories of essential life-sustaining products; estimate stocks in man-days of supply under austere conditions and arrange for distribution of rations at appropriate rates.
2. Identify plants needed to produce a flow of these or substitute products and compare surviving capacity with that required.
3. Where needed, augment capacity by selecting among available alternatives. Alternatives would include suggested projects for decontamination, repair of light damage, repair of heavy damage, conversion, or new construction. Relative desirability among alternatives would be weighed on the basis of cost, time to restore production, site location, and other pertinent factors.
4. Where possible augmentation of capacity proves inadequate for restoration of essential production to required levels, attempt to remove bottlenecks by augmenting necessary supporting capacity (usually for providing material inputs or construction capability).
5. Consider requirements for public works projects to restore transportation or communication links or restore utility services. Some more immediate and localized requirements of these types

might have been met in whole or part under (4) above, but some might warrant more complete solution. Other less critical requirements might then be considered. Selection among proposed projects would be made on the basis of cost, time to implement, services to be provided, situation in the vicinity of the project site, local availability of manpower, and equipment.

6. Consider requirements for specific projects for regenerating other types of industrial capacity. Projects suggested would be rated after consideration of cost, time to reactivate, need for output, local and regional environment, technical feasibility, relation to postattack shortages, and estimates of demand.
7. Consider products and SIC sectors as candidates for relaxation of some or all controls including price and wage controls, rationing restrictions, special limitation orders, and other devices that would prevent economic pricing on the basis of consumer preference and effective demand.
8. Develop a system of information exchange on policy intentions, on emergency demand patterns, on supply-demand imbalances, and on schedules for lowering emergency taxes, relaxing regulatory controls, and withdrawing or suspending government loan guarantees or other forms of interim financing or credit extension.
9. Schedule implementation of loss equalization and systems for financial settlements through laws and policies governing outstanding questions of liquidation principles and procedures and clean up other issues of attack-related litigation.
10. Schedule and implement return to a normal free enterprise economy constrained only by normal regulatory controls.

Such a program would present formidable problems in planning, coordination, administration, and control. In the United States, it would have to be organized as a cooperative endeavor of business; federal, state, and local governments; and private individuals. The ten phases cited are amplified and modified in Chapters V and VI, but the present version suggests some of the abnormal problems that would face business managers and planning staffs in the months or years before recovery has been assured and normal times restored. In many respects, business executives would have cause to wonder whether they represent their stockholders or the country at large. Their problems would resemble those for all-out war mobilization, intensified and accelerated by an order of magnitude. On the other hand, government administrators would have been brought in--

many from field offices or civil life--to deal with economic, political, and legal problems of great theoretical complexity, but of great practical significance and hence great general public interest. Organizational and procedural problems would be monumental. Conventional business management along with everyone else could be poorly prepared for decision-making in such an environment.

IV DISRUPTION OF CHANNELS OF BUSINESS ACTIVITY

Demand and Prices

The normal economy has many devices for natural selection among economic innovations, products, and projects. These include political, cultural and social pressures. The most important forces are those emanating from marketplace expressions of consumer preferences and behavior patterns. These normally have direct effect only on consumer products offered in retail establishments and tend to be observed through evidence of unexpected demand at established retail prices. Manufacturers can adjust in some cases to observed deviations from expected sales by limited price adjustments, with some consequent shift in profit margins. Extreme cases of large and persistent deviations will lead to capacity expansion or, in the unfavorable case, to elimination of items from a product line.

Over time, shifts in demand first generate price changes, then shifts in the demand for raw materials and labor, and ultimately changes in the demand for facility expansion, new construction, and producers' goods. Sudden displacements of demand because of great income shifts, government actions, disaster, or other drastic changes in the consumers' environment may vitiate the salutary effect of price changes and produce major shifts in inventories that cannot be controlled by short term production adjustments.

In the case of a sudden upward shift in demand, facility expansion is too slow to meet the need. In the case of a downward shift in demand, plant closure or conversion of the plant to some other use is appropriate.

If the drastic perturbation in demand were the result of an attack, many whole lines of items could be affected and a broad reorientation of industry would be necessary. Such a shift would not be easy to appraise and to respond to (even in many months) since plant conversions take time and supplies and entail redesign of production lines with new input requirements. Planning the facility conversions would require profitability analysis and this would be difficult in the absence of good estimates of probable prices for outputs and inputs alike. Professional estimates of some of these prices are the result of trading in the commodity (futures) markets. If these markets were suspended from operation or not functioning appropriately, even this mechanism for advanced indications of probable prices would be denied or ineffective. The reactions of

businessmen would probably be to shut down and await developments. The clearest and dominating sources of demand would come from government projects, and business would have to readjust capacity and products accordingly. Items not in demand would probably disappear from the markets.

The composite effects of such events would be to dry up markets for all but essential consumer items or items of interest to the federal government. Some time would be required before new high-demand items could be identified and the process of supplying and organizing production lines could be initiated. Scarcity of producers' items and various materials would grow, and their prices would become inflated. At this point, the government would probably intervene with price freezes, priorities, limitation orders, and some form of consumer rationing. Spreading price limitations would exaggerate demand and greatly increase apparent shortages (and real shortages as hoarding began). From this point on, the government would have effectively taken over the role of the marketplace in naming prices--not only for controlled items but for others as well. If controls were extended to items on the commodity markets, no materials would be left subject to open bidding, and general rationing of materials would become necessary. The government could then be denied any external basis for price setting, and profit margins would adjust to shifts in prices and costs implicit in government contracts. For better or worse, the government would be establishing markets through specific contract negotiations.

In normal times, the price mechanism--and particularly the commodity markets--tend to provide an orientation to the whole economy by establishing the relative profitability of different final demand products when offered for sale at prices attractive to the manufacturer. This mechanism (through which individual citizen consumers cast their votes for some products over others) would not be necessary immediately after the attack since food and essential survival items have the highest value. Choices among alternative foods might be few and relatively unimportant. Later in the rehabilitation period when alternative products could be made available, the price mechanism would be needed again to provide a steering device for the economy. Reorganization of the commodity markets is a first step in meeting this requirement.

The Securities Market

The second most important free auction market in the economy is the securities market, or explicitly, the exchanges. These institutions play a major role in channeling investment funds into the hands of those business managers who happen to have inspired the most confidence among the

persons in a position to invest. In the immediate postattack period, investment would be particularly important, but the securities markets would not, because the major investment needs would be for public welfare projects such as bridges, highways, housing, and heavy industry. In fact, closure of the markets (suspension of trading) is generally considered desirable to prevent undue speculative activity.

Governmental funds come from taxes or from borrowing effected through sale of bonds offered as duly authorized bond issues. New borrowing and increases in income tax and tax withheld from wages could be combined to finance government activity. At some point, funding should again be directed into corporate channels to support facility repair, conversion, and expansion. If conditions remained very uncertain, such financing also might have to come from the government or at least be guaranteed by it. Ultimately, some restoration of a market in corporate stocks or bonds would be desirable.

In normal times, the investors' choice among individual stocks or bonds and his overall choice between stocks as a group and bonds as a group depends on his expectations of future dividends, appreciation, interest rates, the future possibilities for alternative investments, and his desire to share in the selection of corporate management. Immediately after the attack, information would be lacking about the health of individual companies. The stock markets would (if operative) be subject to wild movements in the absence of any rational basis for stock analysis. Moreover, there could be a number of opportunists engaged in efforts to gain control of particular companies and a rash of proxy fights might further agitate the market. As a result of this and the effects of government borrowing on interest rates, bond prices would probably be depressed and unstable. During this period, a case could be made for letting corporate investment funds come from or through the government.

After adequate stabilization of economic affairs was achieved, it would become desirable to return the job of channeling investment funds among the various corporations to the security markets. In general, transfers of securities in the exchanges do not provide such funds directly but do so through effects on the market for new stock or bond issues--whether or not these are offered to the public. Through the action of the securities markets, therefore, the individual private investor influences the flow of capital directly and also influences it indirectly through support from institutional investors; i.e., mutual funds or financial corporations authorized to hold corporate stock or bond portfolios. Re-establishment of the securities markets thus would free the government from direct decisions controlling use of capital.

In 1963, investment funds came from various sources in proportions and amounts as shown in Table 12. The financial effects noted in Chapter II would greatly change this picture. In a very real sense, no funds would be available immediately after an attack if past obligations and fiscal structure were not to be honored, since new investment could then be funded only from current income set aside. In practice, the situation would be somewhat different--perhaps resembling the proportions given in the last row of Table 12, assuming that consumer expenditures could be kept to perhaps 50 percent of GNP. In the absence of consumer products, such a high savings ratio might be achieved, at least initially. The split between withholding taxes and sales of government bonds in such a situation would be rather arbitrary, since the ultimate source would intrinsically be the private wage earner, but a half and half split might be plausible psychologically.

Intermediaries

As previously mentioned, there has always existed in the United States a large number of individuals or organizations engaged as intermediaries between manufacturers and their ultimate sources of supply or their ultimate customers. On the supply side, many dealers in materials exist as indicated in Table 13, which shows volumes handled, the number of companies and employees involved. Parts, components, and subassemblies are usually supplied through subcontracts, but general purchase items might be obtained from dealers and other sources in the proportions as shown for 1963 in Table 13. Production equipment of specialized types is often purchased under contract, but middlemen may help to locate supplies or may represent equipment manufacturers. General purpose equipment is frequently sold directly but also is available from dealers (e.g., members of the American Machinery Dealers Association for used equipment).

On the distribution or marketing side, manufacturers frequently use brokers or distributors even if they have their own sales organizations, and the organizations that find equipment will be representing buyers for some items and sellers for other items.

All these middlemen combine experience in and knowledge of several industries with information on and personal contacts with sources of supply and possible markets. Altogether, these intermediaries may number in the thousands and may employ as many as three million agents or representatives. Established brokers, distributors, or wholesalers are normally classed under wholesale trade, and account for nearly 95 percent of the total employment in the field. Manufacturers representatives

Table 12

SOURCES OF INVESTMENT FUNDS
(Billions of Dollars)

	1957	1958	1959	1960	1961	1962	1963	1964	1965
Personal savings	\$20.7	\$22.3	\$19.1	\$ 17.0	\$ 21.2	\$ 21.6	\$ 19.9	\$ 24.5	\$ 25.7
Gross retained earnings	49.8	49.4	56.8	56.8	58.7	66.3	68.8	76.9	83.4
Total	\$70.5	\$71.7	\$75.9	\$ 73.8	\$ 79.9	\$ 87.9	\$ 88.7	\$101.4	\$109.1
Net government receipts	86.8	81.6	95.0	103.3	103.3	114.2	124.3	127.5	139.4
Surplus or deficit (-)	0.7	-12.5	-2.1	3.7	-4.3	-2.9	1.8	-1.4	3.2
Net foreign investment	-3.4	0.2	2.3	-1.7	-3.0	-2.5	-3.1	-5.7	-4.2
Gross private domestic investment	67.9	60.9	75.3	74.8	71.7	83.0	87.1	93.0	106.6

Source: The National Income and Product Accounts of the United States, 1929-65; statistical tables.

Table 13

MERCHANDISE AGENTS AND BROKERS
1958

Business	Number of Estab- lishments	Sales (billions of dollars)	Payroll (millions of dollars)	Number of Employees (thousands)	Number of Pro- prietors
Automobiles, auto equipment, tires, and tubes	829	\$ 1.0	\$ 21.0	3.8	657
Drugs, paints, and other chemicals	662	0.8	19.7	3.5	404
Dry goods, apparel footwear	2,107	4.6	82.6	13.2	1,599
Groceries and foods	4,559	10.9	164.7	31.1	3,854
Raw materials (farm)	3,765	12.8	98.3	35.8	4,010
Electrical appliances, equipment, and electronic parts	2,059	2.4	54.5	8.2	1,591
Hardware, plumbing and heating, and air conditioning	1,462	1.2	31.5	5.1	1,264
Industrial, farm, professional, and service equipment	3,699	3.2	94.1	15.1	2,537
Miscellaneous, including metals, minerals, scrap, tobacco, beer, wine, and alcoholic beverages, paper, furniture, lumber, and construction materials	7,425	9.6	179.1	32.8	5,286
Total	26,567	\$ 46.4	\$ 745.4	148.4	21,202
Total wholesale trade	28,096	285.0	13,198.7	2,797.3	157,462

Source: Department of Commerce, U.S. Census of Business—1958, Wholesale Trade.

and diversified operators account for the rest--these specialize in certain product lines or in certain kinds of buyers.

The portions of this group of primary interest are those concerned with producers' goods rather than retailer outlets. These agents normally use a number of different modes of search: advertisements in trade and association journals or publications, canvass of clients or potential clients, telephone inquiries to one another (usually via known specialists within a larger group), and knowledge of capabilities of particular vendors or of needs of particular manufacturers. In general, such activities would be even more important in the postattack period than now, and most of the methods of the trade would still be operable. Several circumstances would hamper efficient operations, however. The fact that at least one-tenth and possibly as much as nine-tenths of the potential sources of supply or of demand might be eliminated would reduce the places to search and the chances of finding matches. Some initial effort would be required to establish which were missing and to revise lists of companies and persons to contact. Reduction in ease of finding desired items or sources would intensify the volume of search activity. Transportation difficulties would constrain the search for heavy goods or materials to regions neighboring the source of the requirement. The general prevalence of light damage would increase the availability of used, but possibly unserviceable, items as well as the need for an accelerated capability for reclaiming and repairing machine tools. The general reorientation of industry to meet changed demand would greatly alter the demand patterns for producers' goods and would intensify the search effort for some industry combinations. For those agents who were searching for or representing sources for custom-built equipment or specialized contract-constructed facilities, greatly increased demand would force consideration of less appropriate or marginal sources and widen the field of search with respect to kinds of manufacturers to be contacted. Restrictions on or increased relative cost of personal travel and transportation would require increased reliance on correspondents for investigation of and reporting on possible items or sources of supply. Relaxation of specifications might occur but a premium would be placed on complete and accurate verification of the adequacy of candidate offerings.

Collectively, these factors would tend to increase the requirements placed on and importance of the middlemen associated with moving producers' goods. None of these factors would appear to prohibit normal methods of operation of the agents, but all would tend to increase the costs and reduce the efficiency of their activities. A concomitant effect would be an increase in the communications load associated with the activity--particularly over channels used in support of the hyperactive industries. With a general reduction in less important communications

because of reduced capacity and increased cost, equipment and supplier search could occupy a much greater fraction of the total communications work load.

As previously mentioned, credit rating activity for business-to-business transactions would become more significant. Information required might be more sophisticated, partly because of a need for reassurance on both financial responsibility and technical capability, partly because of a more fluid or volatile business community, and partly because of a generally less experienced management class. A service such as Dun and Bradstreet could play a more important role, but correspondents or investigators might require the assistance of technical advisers. More frequent updating of files and more complete documentation might also become necessary.

Other Business Services

Advertising account executives, market research groups, sales organizations, data processing experts, traffic routing experts, security analysts, and accounting and legal advisors might continue to perform their present functions but would find their environment and working conditions greatly altered. Printed news media would be greatly reduced in number and in frequency of issues. Institutional and employment advertising may be relatively more important than advertising of products.

Analysis of the restricted markets for the products of plant conversion could be important for project evaluation and for new issue underwriting. Surviving data processing equipment would be scarce, overloaded, and possibly requisitioned by government. Joint operation or time sharing of computers might alleviate this problem and a return to manual accounting might be necessary for smaller operations. Expertise in traffic routing, accounting and auditing, and law would be scarce, in great demand, and badly in need of updating. Fragmented and restructured transport nets would require study and updating of rate structures. Bankruptcy and liquidation proceedings might occupy many accountants and lawyers, and changing laws and regulations could complicate their activities. General uncertainty and scarcity of experienced and imaginative advisers of all types might make expert counsel somewhat untrustworthy, and might further complicate business planning.

Business decisions would have to be made at a greatly accelerated pace in the absence of relevant information and without staff or time for adequate analysis. For some time, knowledgeable experts would be needed to train new administrators and retrain old ones. Such factors could not help reducing the efficiency and productivity of business and industrial operations.

The extent of such degradation of productivity is hard to estimate, but it would increase more than in proportion to the general level of damage.

V RELATIONSHIPS AMONG FEDERAL, STATE, AND LOCAL GOVERNMENTS

The preservation of a free enterprise economy has been a traditional aim and policy of the U.S. government. In times of military crises, however, some resort to direct economic controls has always occurred. After the massive damage that would result from nuclear attack, it is inconceivable that drastic and varied controls would be entirely avoided. The imposition of controls is, in a very real and tangible sense, a disturbing influence on the economy, and the net effects of controls are a reduction of national output below maximum potential--if actual and potential output is measured by national product in real prices.

Government Controls

Considerations of equity and the desire to supply essential survival items to the greatest number of people would force the government to establish a rationing system and a system of price fixing--at least for rationed items. The imposition of some controls inevitably leads to the introduction of others. The drastic changes in relative abundance of labor and facilities, as well as other imbalances, would also exert pressure for controls. Facility shortages, combined with surpluses of marginal labor, could lower real wages significantly; a value as low as a tenth of preattack levels is not inconceivable. Shortage of skilled workers and managerial talents could increase the spread of wage rates to politically unstable levels, if heavily progressive withholding taxes were not imposed immediately. Wage controls might be tried instead, but could hamper recovery if upward mobility of labor into higher skills were thereby discouraged.

Real increases in transport costs should favor increased regional self-sufficiency but commensurate increases in freight rates could freeze regional imbalances by making adjustments uneconomical. Depressed areas so created would require government freight subsidies or government financed worker relocation. The relative predominance of traditional or new public works projects in the GNP would also increase the role of government. These and other rigidities or anomalies would force a vast increase in the involvement of government in economic matters. Moreover, the relationships among federal, state, and local governments would be very different from their normal character. Business would be heavily

affected by government regulation in unprecedented ways; this regulation would come from all levels of governmental authority.

Local Governments and Business

Increased needs for regional self-sufficiency would force interaction between business and local governments and would serve to lessen the authority or managerial freedom of corporate headquarters. Local plant management would have to be integrated into local economic development planning. Increased emphasis on local planning, moreover, would prevail just when local planning would be in greatest need for national guidance.

In practice, this would lead to what has been termed input-oriented planning--especially at the local level. This would be characterized by local attempts to use locally available materials, manpower, facilities, and other resources as fully as possible for production to meet the greatest needs of the local markets. With this accomplished, residual resources could be diverted to other production, maximizing the ratios of value added to real transport costs, including costs of making material imports and those for product export. This allocation of local resources might be reasonable if prices and freight rates were not arbitrarily held below real values. Exceptions could be adjusted for in the national interest by subsidies. All such considerations, however, would complicate the planning environment for local (probably inexperienced) plant management.

The necessity for local business and local plant managements of large corporations to interact with or participate in local planning groups, as well as state and federal agencies, would impose an unusual burden on management. Legal problems cited previously would be complicated by an increased reporting burden, including preparation and filing of claims of war loss for validation and for ultimate compensation in whole or in part under loss-sharing policies of the federal government. In some localities, programs for mass feeding, group medical attention, car pooling or commute bus arrangements would all impose on business an increased concern for the welfare of employees of the businesses and their families.

If the government could minimize or avoid direct controls for economic stabilization, some combination of savings bond sales and novel taxes would complicate the withholding and tax collecting activities associated with business payroll preparation. Special industrial reporting procedures and manpower reports would also mean increased clerical burdens for business.

The Federal Government and Business

All of this means that business would be heavily involved with the federal government and vice versa: business would rely on government for national guidance; government would rely on business for local planning, plan implementation, and information; and there would be some delegation of functions back and forth. If this circuit of interlocking responsibility and authority (and the confusion that would be associated with it) were not to degrade productivity unduly, some methods or incentives would have to be found for placing national aims above local interest and for assuring that long-range problems are not forgotten in the more pressing problems of immediate survival. Some discounting of the future would be necessary, and a high rate of discount would undoubtedly be appropriate, but it should not be so great that it precluded facility augmentation. In a situation of shattered and costly transportation, emphasis on local problems at the expense of remote ones would also be desirable, but probably this local emphasis should not be as great as psychologically likely or even as dictated by freight costs.

To understand more specifically what might be expected to occur, it is instructive to consider the state of current planning for recovery, to appraise this in the light of limited past experience here and elsewhere, and in the light of possible circumstances. This has been done partially in various earlier studies.^{1,2,3} A brief summary here of some of the material will suffice for the present discussion.

Current Plans Related to Vulnerability

The relevant plans include the comprehensive state and national plans, generated under the guidance of the OEP (Office of Emergency Planning); the loss equalization planning of OEP, the FRB, and the Treasury Department; survival plans of OCD; and plans for the ODR (Office of Defense

1. Dresch, Francis W., and Hazel Ellis, Methodology for Assessing Total Vulnerability (prepared for Office of Civil Defense), Stanford Research Institute, Menlo Park, California, August 1966.
2. Dresch, Francis W., Review of Research on the Supply-Requirements Problem (prepared for Office of Emergency Planning), Stanford Research Institute, Menlo Park, California, February 1962.
3. Dresch, Francis W., Resource Management for Economic Recovery Following Thermonuclear Attack, Part I: "A System for Synthesis and Feedback of Essential Information"; Part II: "Effective Control of Resources in Recovery Management" (prepared for Office of Emergency Planning), Stanford Research Institute, Menlo Park, California, June 1964 and January 1965.

Resources), the ESA (Economic Stabilization Agency), the OET (Office of Emergency Transportation), and other actual, standby, or paper organizations with some official recognition. Partially relevant experience may be found in previous war economies--both here and in foreign countries. In general, it will be evident that none of this experience is comparable to probable circumstances and that existing plans constitute merely the embryonic precursors of probable business-government involvement. Finally, it will be evident that actual organization would probably be very different from anything here imagined. Some insight into possible organizational evolution can be derived from a more abstract functional analysis of managerial requirements, which will be provided.

It is the stated policy of the federal government that in the event of a nuclear attack, a program for loss equalization will be implemented. The plans to date envisage the establishment of an administrative agency, the AVEC (Asset Validation and Equalization Corporation), with responsibility for accepting and examining loss claims, establishing in pre-attack prices the extent of the loss, and for certifying as to the same. The extent and time of reimbursement and the principles and procedures to be followed, remain under discussion by OEP, the FRB, and the Treasury Department. The original proposals of the FRB envisaged the AVEC certificates of loss as transferable (and thus negotiable) under specified circumstances and acceptable as legal tender for payment of proposed net worth taxes--the latter intended to accumulate revenues from which the certificates might ultimately be redeemed. Since the net worth tax is unconstitutional as outside the taxing powers of the federal government, an amendment to the Constitution would be required. Whether or not this type of tax (essentially on surviving net assets or their subsequent growth) were adopted, and whether or not the AVEC agency was to play a role as a financial agency with loan and tax powers and self-liquidating liabilities, the plan was:

1. To guarantee only partial indemnification
2. To avoid actions inimical to recovery
3. To exclude consideration of losses incurred by federal, state, and local governments (which were construed as capable of recovery via their tax powers)
4. To provide indemnification only after recovery was well under way and subject to an orderly time schedule.

The basic concept, as initially proposed, was rather attractive in that it would (1) ultimately reimburse the unfortunate from the fortunes of the fortunate; (2) not affect the normal taxing powers or delegations

of federal, state, and local governments; (3) provide funds for self-liquidating rehabilitation loans; and (4) permit an orderly redemption of the certificates after a normal economy was re-established. The principal problems were the net worth tax and the seminegotiable character of the certificates, which could generate inflationary pressures on the economy.

Although a loss indemnification plan was instituted in postwar West Germany under the allied military government for token payments, the AVEC plan is unprecedented and untried. A combination of corporate and individual income tax increases could fund the main features of the plan with approximately the same incidence as the net worth tax, and a high rate of interest on rehabilitation loans might bring in additional revenues to minimize the necessary tax increases.

No matter what procedures were ultimately adopted, the loss equalization policy would constitute a major involvement of the government in economic affairs and would affect the subsequent evolution of society. Whether or not AVEC becomes a financial agency, the chances are great that the federal government would become a major financial agency.

Plans for the ODR are patterned after the resource and claimancy agency structure followed in the latter stages of World War II and in the Korean conflict. Certain agencies such as BDSA of the Department of Commerce and the Departments of Labor, Agriculture, Interior, Transportation, and HEW would be responsible for and cognizant of appropriate resources, with the task of organizing effort or production to meet national needs as seen by certain other agencies (claimancy agencies) such as DOD, HEW, and probably HUD. The resource agencies would also have claimancy functions in behalf of the industries they represent. ODR, with full use of an expanded OEP staff, would coordinate resources and claims and adjudicate conflicts. Controls envisaged include the classical indirect controls such as rediscount rates, debt management, currency reform, and direct controls such as rationing, allocations of critical materials, limitation orders, and financing. With general recovery plans as guidance and emergency powers, ODR would attempt to guide the shattered economy to recovery.

With heavy reliance placed on the Defense Material System of BDSA, which would use controls on critical (generally stockpile-type) materials in World War II fashion to guide the economy, these plans do not appear likely to operate well and would probably evolve rapidly into a more detailed interaction between ODR's group of delegate agencies and private business.

In the early postattack period, delays in reconstituting the federal government and in establishing effective operation and expansion of emergency agencies would throw the burden of stabilizing the economy on agencies of the individual states. Through emergency powers of the governors, delegated powers from the President, and standby legislation, most of the individual states have developed plans patterned after OEP suggestions for performing this interim role. Again, some oversimplification of problems, some overoptimism as to the capabilities of state and local governments to take on new functions, and some underestimate of the requirements for recovery management make these plans appear unrealistic. One could therefore expect to see in the early period extensive revamping and extension of these plans beyond present specifications.

An important omission from all these plans is a device or mechanism for assigning relative importance to alternative objectives and for assessing real costs. In the absence of a free market system after imposition of controls, no natural mechanism for pricing alternatives would exist and even a free market system would probably respond too erratically to transient circumstances and too sluggishly to major trends and imbalances to be effective. A new mechanism or conceptual formulation for imputing values could be a prime necessity for assessment of trade-offs. The problem is not so much that of re-establishing a market mechanism for inferring consumer preferences and utilities, but one for rational costing of direct and embodied effort. Some such costing would be essential for realistic appraisal of alternative programs of reconstruction. Social welfare aspects of public works programs have always raised confusing and controversial issues. These would be of dominating importance in a period when a large part of the national effort could be devoted to what is essentially a vast interdependent public works program.

Historical precedents in postwar West Germany, Japan, and Italy have convinced some economists of the economic undesirability of controls or other constraints or any tampering with natural economic pressures. These situations, moreover, were relatively stable and normal compared with possible postattack circumstances when controls and other meddling would be even more difficult to monitor. Finally, these situations were mitigated by massive aid from an external source (the United States) and no such aid could be expected after nuclear war.

Table 14 lists a number of functions normally associated with either operational or long range planning for government or business. It further indicates probable changes in the relative importance of the function to national, regional, or local business management and to federal, state, or local governments in the postattack situation. These forecasts of change are based on estimates of the shifts in requirements and availability of information for the decision-making entailed in the various

Table 14

PROBABLE ATTACK-INDUCED CHANGES IN THE IMPORTANCE OF
PLANNING FUNCTIONS TO GOVERNMENT AND BUSINESS

Planning Function	Changes In Importance to:					
	Business Management			Government		
	Local	Regional	National	Local	State	Federal
New facilities	-	-	-	-	0	+
Facility expansion	-	-	-	0	0	+
Facility repair	+	-	-	+	+	+
New products	+	0	-	+	0	+
Product mix	+	0	-	+	+	+
Production schedules	+	-	-	+	+	+
Materials	+	0	-	+	+	+
Traffic routing	+	+	+	+	+	+
Distribution	+	0	-	+	0	+
Marketing	-	-	-	+	0	+
Promotion	-	-	-	0	0	0
Staffing	+	-	0	+	+	+
Cash flows	+	-	0	0	+	+
Financing	+	-	0	0	0	+
Highway planning	+	0	-	+	+	+
Utility service	+	0	-	0	0	+
Housing	+	-	-	+	+	+
Commuting	+	-	-	+	-	+
Feeding	+	-	-	+	+	+
Rationing	+	-	-	+	+	+
Pricing	+	-	-	+	+	+

Legend: + = Increase in importance.
 - = Decrease in importance.
 0 = No significant change in importance

functions. Whether or not the individual predictions are correct, the main impressions that might be drawn from Table 14 are probably correct; i.e., one should expect an increase in planning responsibilities of local business management and all echelons of government as well as increased involvement of local business management in public welfare problems.

VI VULNERABILITY OF PRODUCTIVITY AND ECONOMIC LIFE

Effects on Management Concepts

Past studies¹ have indicated that the aggregate capacity of facilities lost in (or surviving) a thermonuclear attack would fall into a range of from one- to four-fifths of preattack capacity. The actual position within this range would depend on the nature and effectiveness of the attack. Whether or not output from the facilities that would survive could achieve or exceed rated capacity would depend on the balance among such changes as introduction of multishift operations, substitution of labor for capital, increase in working hours per week, worker skills and morale, bottlenecks, transportation and communication problems, and changes in product mix.

The organizational questions that have been the primary concern of the preceding five chapters indicate that uncertainties in predicting the technical efficiency of the economy might look small compared with even greater uncertainties in assessing possible degradation of productivity through failure of management. The dangers would not be primarily related to the quality of management, but rather to the possible effects of a sociocultural lag in adaptation to an unfamiliar environment. Appropriate responses to the drastic changes in economic conditions are not well established. If they cannot be devised and persuasively defended now, could they be devised and implemented during the first few weeks of the struggle for survival?

Table 15 lists some of the possible changes that could disturb normal practice or destroy the basis for traditional management concepts. If these changes did occur, secondary pressures would also trouble government and business management. Some of these pressures are listed in Table 16 along with countermeasure alternatives. Considered together, these changes would require a large increase in the economic roles of local business and the federal and local governments. These shifts would

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1. Dresch, Francis W., and Hazel Ellis, Methodology for Assessing Total Vulnerability (prepared for Office of Civil Defense), Stanford Research Institute, Menlo Park, California, August 1966.

Table 15

CHANGES THAT WOULD DISTURB TRADITIONAL MANAGEMENT CONCEPTS

<u>Disturbance to or Reversal of:</u>	<u>Has Impact on:</u>
Worker reliance on public or private transportation for community and shopping	Local business management
Regional or centralized vouchering of corporate disbursements	Local business management
Small share of sales to government	Business management
Corporate autonomy in facility expansion	Corporate management
Specialization of industry and substitution of transportation for local integration and self-sufficiency	Local and corporate management
Continuing substitution of capital for labor	Local business and federal government
Increasing demands on labor skills	Business and government
Reliability of business credit	Local business and federal government
Sanctity of contracts	Local business and federal government
Pressures for new product development	Corporate management
The existence of a consumer market for sophisticated products	Local business
Increasing regional interdependence of industry	Local business and federal government
Increasing struggle for and reliance on national markets	Local business and corporate management
Reliance on reliable and responsive utility services	Local industry and all levels of management

Table 16

SECONDARY PRESSURES ON BUSINESS AND COUNTERMEASURE ALTERNATIVES

Secondary Pressures	Countermeasure Alternatives
Absenteeism	Reshuffling housing Company barracks Company commissary Company feeding Company dispensary
Localizing of accounting	Increase clerical and G/A staffs Establish community clearing agency
Plant accounting for government	Add government contract experts Simplify and standardize government reporting
Pressure for intercorporate cooperation	Suspend anticooperation aspects of antitrust Weaken control of plants by corporate management Organize cooperative construction of new facilities
Local self-sufficiency and independence of transport	Continuing analysis of export-import balance and alternatives to minimize transport Develop possibilities for local substitution Transport dies, templates, and plans rather than items Restrict highly specialized equipment to unique production
Substitution of labor for capital	Job analysis to simplify training and skill requirements Emphasize full utilization of equipment
Emphasis on widening labor market	On-the-job training Increasing number of assembly line stations Separation of clerical from production tasks
Establish local but official credit	Develop national standards for authorized local credit reporting system Restore national boundary system
Redefinition of contract forms	Possible tripartite contracts with government mediation
Reoriented production	Plant conversion programs Retraining personnel Reorganizing production lines
Reduced demand for sophisticated products	Morale building and skill maintenance programs for workers
Regional independence of industry	Further modification of product lines to localize sources of parts and materials
Drying up of national markets	Short production runs
Unreliable utilities	Standby utilities

be accompanied by a corresponding reduction in the economic importance of state governments as well as that of regional and national corporate managements. Such changes might not be important in themselves but could become important because of the inherent difficulties that the federal government would encounter in disengaging itself from business matters or that business could experience in disengaging itself from local public affairs.

In the case of government, a primary problem would be the relaxation of economic controls. The severity of this problem would be less if direct or rigid controls were avoided, because indirect control through taxes, debt management, and rediscount rates could be relaxed gradually. Direct controls (such as price fixing; material and manpower allocations; and direct government control and support of facility expansion, agriculture, transportation, and utilities) tend to leave the economy far from its natural equilibrium and can produce rather drastic and erratic reactions when they are rescinded; even if this is carefully scheduled product by product or item by item.

In the case of business, primary problems would relate to restoration of normal interbusiness relations, reduction of the influence of business entities in local political affairs without losing too rapidly the support and public services of individual business leaders, and restoration of normal decision-making procedures to substitute for ad hoc committees and other emergency arrangements.

The problems of restoring traditional separation of business and governmental functions become more evident if the nature of possible emergency measures is considered in greater detail, particularly those affecting local business management. The federal government would, through the operations of the ODR and its delegate resource and claimancy agencies and their supporting analytical staffs, establish general policies for the orientation of the rehabilitation and later recovery effort. To do this effectively, the government would need more information as to the precise state of the economy than ever before. Much of this information would have to be collected from business--particularly from local plant management--and processed through an elaborate network of information processing and abstracting organizations. At the federal level, concern would center primarily on major issues of national or at least regional impact. Action would consist primarily of specific support and control of facility construction, preparation of policies, and dissemination of general guidance to local resource and recovery management agencies. These local agencies of unprecedented character would have considerable authority and autonomy for integrating available facilities (irrespective of corporate ownership) and other resources including materials and manpower.

As mentioned previously, the primary task of management as a whole would be to divert enough productive capacity to the repair, conversion, or reconstruction of facilities, without threatening immediate survival. The U.S. economy has relied heavily on low cost transportation to achieve a high degree of specialization in industry. This has resulted in a loss of regional self-sufficiency, a high degree of centralization for many particular industries, and a great interdependence among industries. Moreover, economies of scale have led to heavy dependence on national and often international markets. Finally, production has been geared to the existence of a large consumer market. The high intrinsic cost of transportation (with some possible isolation of parts of the country), the collapse of the consumer market here and abroad (and drastic reorientation of the nature of this market), the great expansion of demand for construction and production of goods supporting it (oriented toward public works, housing, or facility expansion), and a massive deurbanization (from the point of view of residences if not place of work) would all tend to leave surviving industry rather poorly adapted to urgent needs.

The useful output from surviving production facilities could not be expected to reach the levels that might be achieved if plants were permitted to work exclusively on the product mix for which they were designed and at the volumes for which they were most efficient. Moreover, the desirability of increasing regional or local self-sufficiency would lead to some sacrifice of the efficiency gained through specialization. These and other factors would make it imperative to see that no usable plants were left idle at any time. The primary damage that might result from poor management would come from failure to get facilities promptly into production directed to most urgent needs. This is particularly true for the first couple of months during which time immediate current requirements would be greatest and available facilities at a minimum.

The urgency of the situation thus would require rapid decisions and immediate action. The implementing action would have to occur locally, but the guidance of the overall effort would have to come from ODR or some agency in a position to consider the situation nationally and to match capacity to national needs.

Plans for ODR do not as yet specifically provide for the degree of local involvement that would undoubtedly be necessary in the aftermath of a massive thermonuclear attack. Moreover, these plans do not cover the detailed information required for recovery management. There are good and sufficient reasons for confining emergency plans to broader issues at the present time. These reasons are primarily rooted in questions of political timing, but there are inherent technical difficulties in designing and implementing a complete and detailed plan. At some time, the open

issues about sources and flows of information would be resolved. The nature of the ultimate solution is a matter of conjecture but the best clues regarding the likely developments can be obtained from considering the probable economic situation and the functional and informational requirements for recovery management.

Facilities would be at a premium, and the dominant task would be to utilize the functioning facilities for production of the highest priority. However, priority shifts and immediate needs could not be allowed to preclude entirely the appropriate consideration of longer range requirements. The availability of inventories for immediate survival would give some leeway, but the irreducible minimum lead times required to prepare facilities for replenishment of these inventories would dictate that such preparations be started promptly. The decisions to be made in the struggle for survival in the long run would include some of the most difficult decisions ever encountered in total economic planning. The planning would have to allocate available resources to balance immediate requirements and future ones. Long run plans would be worthless if the economy failed to survive earlier periods. Efforts for immediate survival would be wasted if they dissipated time or resources needed to assure continued survival.

Planning Schedule

Planning would have to be formulated in terms of a master schedule and with much of the philosophy and methodology of PERT-cost scheduling. If this were to be done simultaneously on a local, regional, and national basis, the detail work required would become formidable. Table 17 lists some of the generic tasks that would have to be included in such a plan and Figure 1 provides an illustrative GANTT chart for incorporating some of these items in an integrated plan. Figure 1 is greatly oversimplified and restricted to a standard local or regional plan. The timing indications are pure guesses and are included for illustrative purposes only but are probably correct in requiring that most of these tasks be started during the first three months. Figure 1 would in practice be supplemented by other charts for local or regional plans and for specific detail.

The point to be made here is merely that some such detailed scheduling would probably be essential for long run survival. The preparation of any such plan would not be a one-time task but would be a continuing effort requiring quick tentative skeletons to be filled in and revised as necessary or possible. The required interactions among local and federal agencies, business managements and governmental bodies, labor and management, finance and industry, trade, and the consuming public would be far reaching and unprecedented. Table 18 lists some of the trade-offs to be considered and constantly re-evaluated at all echelons of management.

Table 17

TYPES OF COMMUNITY OR REGIONAL REHABILITATION TASKS FOR A LOCAL PLAN

Restoration of essential utilities

Simplification of utility networks, improvising local utility arrangements

Impounding, measuring, and conserving supplies, gasoline, and diesel fuel

Impounding and inventorying foods and food materials

Impounding, inventorying, and establishing control of drugs, pharmaceuticals, and medical supplies

Canvassing local possibilities for petroleum refining

Conducting a process inventory on local plants

Preparing a bill of essential local requirements

Checking local processes and material sources to meet all requirements possible locally

Investigate, if necessary with federal assistance, import sources for deficits

Prepare schedule of exportable surpluses

Start high priority production included in preliminary plan

Identify labor and material requirements to support this production

Allocate labor and materials available and import remainder

Allocate remaining process capacity to second priority uses

Allocate labor and materials available and schedule material and component inflows

Arrange for shipments of any exportable surpluses included in local output

Start local food processing

Start peripheral agriculture

Start debris clearance on a priority schedule

Consider billeting, barracks operation, or other temporary housing

Start housing projects

Consider commuting and public transit problem

Reorganize local retail trade

Reorganize wholesaling and brokerage functions

Reorganize expeditors, merchandising agents, and manufacturers representatives

Reorganize credit functions and banking system

Re-establish and reorganize legislature

Table 17 (concluded)

Re-establish and reorganize courts

Establish voter registration lists and election machinery

Establish ration boards, price control boards, and other emergency agencies

Reorganize school system

Figure 1

SAMPLE GANNT CHART FOR SCHEDULING START OF REHABILITATION TASKS

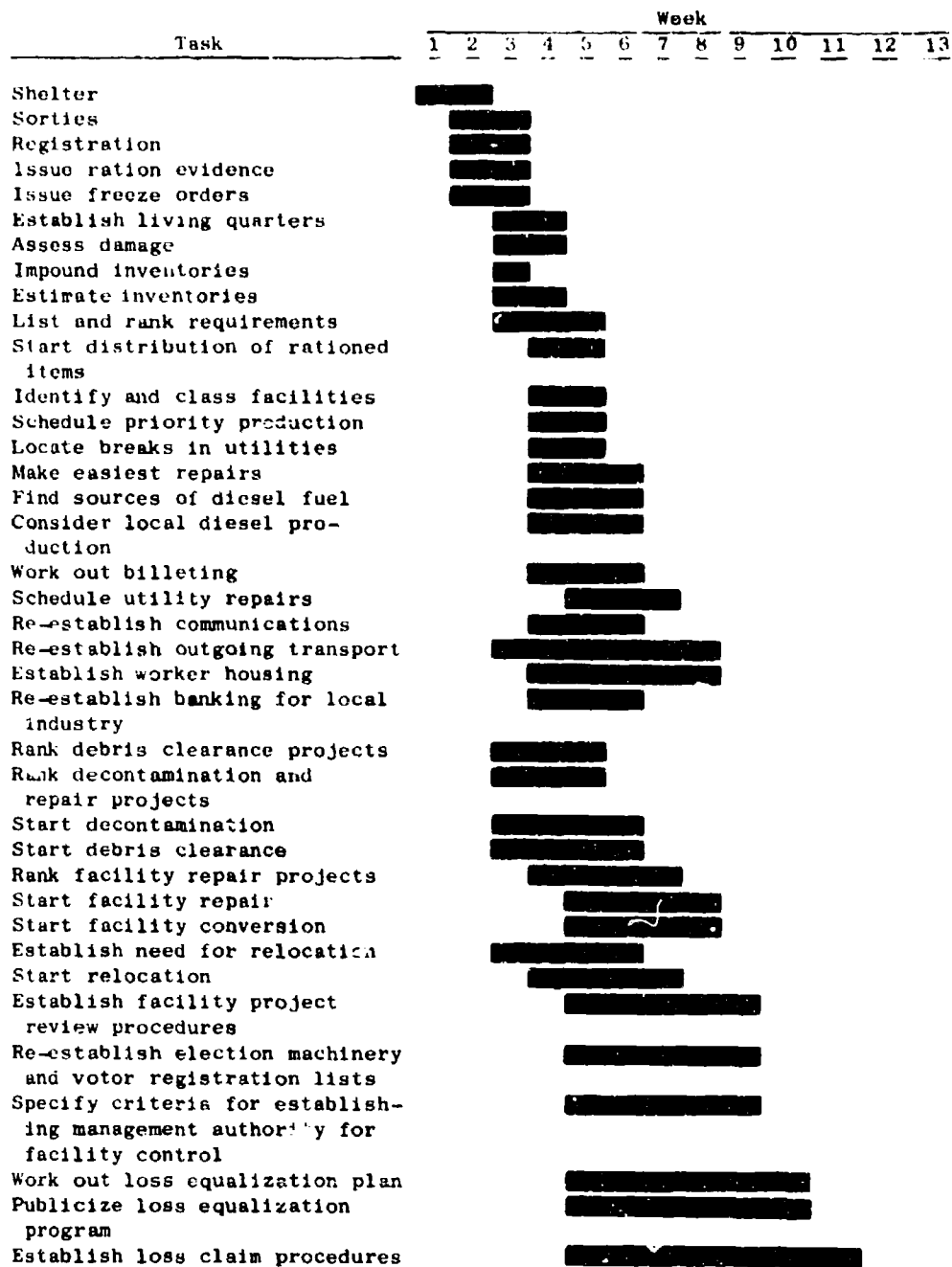


Table 18

EXAMPLES OF DECISION ALTERNATIVES OR TRADE-OFFS

A	versus	B
Restoring utilities locally		Reintegration into networks of larger regions
Moving utilities to people		Moving people to utilities
Temporary or improvised utility solutions		Waiting for permanent utility restoration
Gasoline storage in vehicles		Draining vehicles in service stations or bulk trucks
Diesel storage in vehicles		Consolidating diesel in bulk trucks
Establishing topping plants		Waiting for restoration of refineries
Conversion of business to low grade funds		Waiting for restoration of fuel sources
Releasing food materials for home processing		Waiting for normal food processing
Centralizing medical services and supplies locally		Heavy reliance on first aid and home medications
Let plant management react to obvious or stated requirements		Inventory processes on a locally integrated basis
Assign facilities to most efficient use		Assign most urgent needs to most favorable process
Prepare catalogue of facilities or processes		Prepare detailed lists of essential products

The data bank requirements for centralized management of the details of such a network of schedules would be impractical today and inconceivable for the postattack situation. In the absence of such a centralized data bank, the actual implementation of decisions embodied in the scheduling process would depend heavily on local management groups. The functions of these groups would include management of all local activities in the scheduling process, balancing out material and resource availabilities against requirements, coordinating efforts to import net requirements or dispose of net surpluses, and finally, negotiating with regional or national scheduling agencies to obtain revisions of infeasible schedules and to obtain outside assistance where needed to meet schedules. The exact organization of these groups, the sources of their staffs (whether federal employees, local volunteers, or specialized recruits), and the sources, scope, and nature of their authority and responsibility are not important to the present discussion. It suffices to recognize that functions of these types would have to be carried out locally and that traditional business management would be inadequate for such purposes unless drastically modified to take on such unusual functions.

The problem of relaxation of controls would not affect productivity in periods prior to recovery but fear of such problems could constrain the manner in which controls are imposed initially and could thus affect productivity indirectly. This would be true if drastic controls were already the best immediate or interim solution, but were rejected in favor of less effective measures chosen to avoid "withdrawal symptoms." This would certainly be the case if adoption of inadequate controls led to runaway inflation. This could also happen if excessive respect for the rights of personal or corporate property permitted wasteful competition, monopolistic withholding of productive effort, or other underutilization or improper use of facilities. If portions of the economy were left near the margin of survival, such waste could be catastrophic.

Vulnerability Characteristics

The following circumstances could dominate the situation following severe thermonuclear damage:

1. Normal modes of short haul transportation could be unavailable, including private autos, mass transit, and regular public carriers.
2. Facilities would be scarce and needed primarily for production unfamiliar to management and for which the plants were ill-suited.

3. Plant operations would be subject to uncertainties in delivery of supplies.
4. Planning at all levels would not be a question of modifying or expanding established activities, but would entail charting a new course in unfamiliar waters.
5. Corporate holdings evolved through adaptation to normal economic growth would be ill-adapted to the new situation.
6. Profit incentives would lack normal correlation with individual, corporate, and national objectives.

In other terms, many familiar practices and economic guides would be inappropriate. Specifically, we would find workers forced to spend many hours on foot walking to work or would have to find places for them to sleep in or near their places of employment. We would find consumers spending many hours on foot walking to markets and carrying their purchases home, or we would have to find some means of delivering their purchases or of bringing the market near them. We would find plants designed for production of luxury consumer goods such as radios, TVs, autos, or even refrigerators converted to production of hammers and shop tools or other items of more immediate interest. We would find manufacturers looking for unfamiliar types of materials in unfamiliar places even where such materials were rarely found before. We would find corporate managements responsible for an ill-assorted and poorly located collection of facilities and engaged in varied activities mostly alien to the corporate experience and too disparate to facilitate molding a new corporate image. With national markets inoperative and local needs paramount, surviving corporate managements might prove anachronistic and subject to replacement by local, more functional combinations.

At first, any reorganizations responsive to the changes in the economic environment would appear to be temporary expedients dictated by a transient situation. As always with temporary adaptations, the changes could prove self-perpetuating and could lead to a proliferation of city-state-regional economies--islands of self-sufficiency if not survival--that could become quite parochial in outlook and too competitive with respect to possible interstate commerce (the export markets of the era) to permit economically peaceful coexistence. The primary economic problem of the federal government, however constituted and however rechartered, would be the preservation of national goals in the face of the temptations of and tendencies toward fragmentation.

Profit incentives would align themselves with the interests of the local complex except for the lure of direct sales to the federal government. The importance of the federal government as consumer would depend on its ability to retain its financial leadership and its taxing powers. Moreover, these would depend on its ability to identify and actively support mutual needs and to show promise of meeting these within an acceptable time span. The urgencies of the immediate situation would reduce the extent to which local areas would support long term mutual objectives but would increase their dependence on the federal government for any projects agreed to that would require a long wait for completion and pay-out. Profit incentives would be associated more positively with discernible effective demand and (except for some federally supported efforts) this would emphasize local and immediate requirements. Financing problems would also favor the present, obvious, and near-at-hand over future, more imaginative, or remote business opportunities.

To the extent that materials or intermediate products could be generated locally and appropriately allocated among users on firm schedules locally agreed on and locally enforced, required inputs and product shipments could be reliably controlled. Inputs from remote areas or markets for exports from the area, however, would be extremely uncertain. These circumstances would provide additional pressures favoring localism and short range goals.

Planning information and incentives would be lacking for long-range planning at the level of local complexes. On the other hand, simple operating problems would become unusually difficult. Past experience of plant managements would often be irrelevant to operating problems; costs would be almost unpredictable; and price controls, rationing and other rigidities imposed on existing market imperfections would obscure the evaluation of decision alternatives. However, some of the decisions to be made, if not made politically, will entail unusual departures from preattack or even current operations. The usual management decisions entail only minor expansions; tentative experiments with new products or changes in product lines; and modifications in established programs for growth, acquisitions, or diversification. A nuclear attack would produce a major reorientation, while equally drastic changes would be occurring among vendors, competitors, and traditional customers. With the individual plants faced with problems of reorganization of processing lines, plant layout, and retooling, the external environment would be in a comparable state of flux. Business management would be struggling with very difficult problems.

As previously mentioned, the relationships between management and the employees would suddenly have become far more involved than usual

because the individual worker would have unusual problems in getting to work; in tending to the needs of his family; and in coping with a strange legal, social, and economic environment. To some extent, local governmental or quasi-governmental bodies may help alleviate such problems by improvising barracks, billeting arrangements, or new kinds of mass transit. However, plant management would be forced to participate in such planning and to readjust many of its practices to meet the unusual situation. Some of the innovations might include staggered work shifts, in-plant feeding operations, provision for company stores to facilitate purchase of necessities, and other assumptions of functions or services normally provided by the community.

The individual would find his freedom greatly restricted, not so much from legislative encroachments on his traditional rights, but rather from the loss of privacy that would accompany overcrowding and the loss of mobility. Rationing, wage stabilization, high taxes, wage withholding, possible restrictions on change of employment, or even the application of a labor draft (at least for skills in exceptional demand) would be causes of irritation. However, the greatly lowered standards of living; the loss of compensating status symbols; the lack of any escape from the pressures of family, colleagues, and neighbors; and the rigidities of postattack life generally would have a greater effect in contributing to mental depression, poor morale, and lower productivity.

The weakening of social walls erected by the individual to protect himself from the outside world, the loss of a sense of adventure, and a growing sense of futility accompanying the suspension or fading of private hopes could all contribute to general anomie. Group projects and public efforts to establish group activities could counteract these effects, but could backfire if pushed overzealously.

As long as personal survival was in doubt, many of the psychological problems cited would not be important. The most dangerous period would be when the obvious, immediate requirements were met but, when subtler, more remote, and more obscure threats would have to be prepared for. These would include timely replenishment of dwindling inventories and repair and expansion of facilities to offset capital consumption. The problems of maintaining morale would increase further in the period when net expansion of productive capacity could be initiated--the expansion that would have to occur before recovery could be regarded as under way. In this phase, the need to divert output into capital and facility expansion would not be very obvious to the general public and enlightened self-interest could not be counted on. This conflict would provide a major challenge to recovery management.

Facility expansion, at least when major projects are involved, should probably be a federal responsibility and planned for on a national basis. The processing of applications for authorization of projects might resemble that associated with applications for certificates of necessity during World War II and the Korean conflict, when priority ratings and accelerated depreciation authority provided the incentives. Some projects, however, might properly be initiated by the ODR itself. This would be true for facilities that served a collective or national need but failed to attract the support of any particular corporation or local area. Procedures for managing such projects are yet to be worked out.

Some locally supported projects might be desirable, but in the national interest it might be preferable to find a site in a different location from that initiating the request. There is at present no procedure for relocating such developments, but such projects could be converted to ODR-sponsored efforts and handled by whatever procedures were adopted for such projects.

A major policy question would entail decisions regarding the desirability of preserving any regional self-sufficiency that might evolve. If ultimate recovery were assured and if the recovery period were expected to be short, consideration of long run advantages from a return to pre-attack specialization should dominate later facility construction planning. If recovery were expected to take a long time, the costs of restoring and expanding transportation capabilities should be weighed against possible economies of scale. It might turn out that lack of gasoline and diesel fuel shortages would be the principal obstacle to rapid recovery of pre-attack transportation capabilities. Assigning high priorities to refinery construction at the earliest opportunity would resolve this problem and combat parochialism and immobility. In this case, ODR should play a far more active role in other facility planning to restore preattack institutions as completely as possible and then withdraw from the scene. If highway reconstruction, railyard and railbed repair, and other facility projects were also major problems, these might dominate federal planning and other facility improvements could better be left in local hands. Questions of such types not only indicate a need for further preattack planning, but preclude confident predictions of actual organizational evolution. The state of transportation and utility services immediately after attack would be the most critical determinant of informational and organizational requirements as well as of economic and social survival.

The areas that have attracted the earliest and most persistent attention in analysis of vulnerabilities are also the most important for analysis of total vulnerability. Subtle influences could contribute to unexpected institutional adaptations and strange social developments.

These influences would all find their origins in conditions resulting from damage to the petroleum industry or to the utility service, especially transportation.

VII LEGISLATIVE IMBALANCE AT FEDERAL, STATE, AND LOCAL LEVELS

Introduction

This chapter considers the institutional vulnerability of one segment of the political system--the legislative system--for the purposes of determining changes that might result in that segment as a consequence of nuclear attack, isolating those changes that might have a negative effect on the U.S. social system, and considering whether plausible countermeasures could be taken to ameliorate anticipated problems.

Legislative Representation and Nuclear Attack

One political effect of a nuclear attack on the United States would be legislative imbalance in some areas at all levels of government. The difference between a light counterforce attack and a heavy SMSA attack would be one of degree and not of kind.

With no warning, it is likely even in a light counterforce attack that some local governments would be knocked out completely--legislators, constituents, buildings, and records. With strategic warning and shelter or evacuation, on the other hand, it is likely that most of the legislators and their constituents would survive, at least in a light counterforce attack. Some problems of misrepresentation through imbalance would likely exist.

Imbalances, however, would become magnified as one would go up the political scale of government and as one would consider heavier attacks. In larger counties that might be only partly destroyed and for states and the nation as a whole, the problems of imbalance could be expected to be more serious. Therefore, this discussion will concentrate on legislative imbalance in the larger units of government.

At state and national levels particularly, where the legislators might be in session, and therefore physically removed from the districts that they represent, it is possible that many legislators could survive but with greatly reduced constituencies either through death or because their constituents would evacuate to other areas. If there were evacuation that lasted for some time, there would be some question as to whether

the legislator in the reception area or the sending area was the legitimate representative of the evacuees.

At the same time, it is likely that some legislators would be killed or injured, and in cases where provision was not made for succession without election, constituents in certain areas would be unrepresented.

Until recently, state legislatures and the House of Representatives were not based on a one-man, one-vote basis. As late as 1962, discrepancies in representation at federal level ranged, for example, from as much as 951,000 to 216,000 persons in congressional districts (Texas); and discrepancies in state legislatures allowed a differential of as much as 6,038,771 to 14,294 persons in districts for the upper house (California) and 4,330 to 3 in the lower house (New Hampshire). These ratios are 4.4, 422.5, and 1443.3 to 1 respectively.¹

Supreme Court decisions in 1962 and 1964 made it mandatory for the House of Representatives to be based "as nearly as is practicable" on a one-man, one-vote principle,² and required substantial equality among state legislative representation districts in both houses of a bicameral legislature.³ Until this time, the rural areas were overrepresented. A heavy cities attack could result in urban legislators representing greatly reduced or dispersed constituencies, and cities could be favored over rural areas--the exact opposite of the situation that existed before the Supreme Court decisions.

Succession

At the federal level, the Constitution provides the following manner of filling vacancies in the House of Representatives:

When vacancies happen in the representation of any state, the executive authority thereof shall issue writs of election to fill such vacancies.

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1. Schubert, Glendon, Reapportionment, Chas. Scribner & Sons, New York, 1965.
 2. Westbury v Sanders, 1964.
 3. Baker v Carr, 1962, Reynold v Sims, 1964.

The Constitution provides the following manner of filling vacancies in the Senate:

. . . if vacancies happen, by resignation or otherwise, during the recess of the Legislature of any state, the executive thereof may make temporary appointments until the next meeting of the Legislature, which shall then fill such vacancies.

When vacancies happen in the representation of any State in the Senate, the executive authority of such State shall issue writs of election to fill such vacancies: Provided, That the legislature of any State may empower the executive thereof to make temporary appointments until the people fill the vacancies by election as the legislature may direct.

In other words, unless a Constitutional amendment were enacted to allow vacancies in the House of Representatives to be filled by appointment or succession laws, these positions would be completely dependent on election. It has already been suggested that the Constitution be amended to authorize governors to fill temporary vacancies in the House caused by national disaster, but, since this is no easy process, this has not been accomplished, and there is considerable doubt that it will.

At the state level, as of January 1967, 24 of the 50 states had enacted legislation to provide for legislative succession. These states are listed in Table 19. For the most part, this legislation follows the continuity of government program suggested by OEP in cooperation with the Council of State Governments. To put it another way, 26 of the 50 states have not enacted such legislation.

Table 19

STATES WITH LEGISLATIVE SUCCESSION

Alabama	Nebraska
Arizona	New Hampshire
Arkansas	New Mexico
California	North Dakota
Delaware	Oklahoma
Georgia	Oregon
Idaho	Pennsylvania
Iowa	South Carolina
Kansas	South Dakota
Louisiana	Virginia
Maine	Washington
Minnesota	West Virginia

Note: A few entries have been included when the legislation was considered consistent with the objective even though it was enacted before publication of the suggested legislation by the Council. The legislation naturally differs somewhat from state to state. The table, however, presents a reasonably accurate picture of the current status of preparations for continuity of government in the states.

Source: Council of State Governments and OEP.

VIII ELECTIONS

Introduction

It would be virtually impossible to hold elections shortly after an attack in anything but a very light damage situation. It is likely that many registration records, birth records, and other important documents would be lost or destroyed. In cases where registration records were intact, they would in most instances be out of date due to deaths or migration. Residency would be difficult to establish, and, in the case of migrants, the strict residency requirements of many states would reduce the number of eligible voters to a great extent. It was estimated that 10 million voters in 1956 were disenfranchised--6 million because of residency requirements alone.¹ It appears clear that many more would be disenfranchised if there were any type of nuclear attack.

Table 20 lists the residency requirements for all states. It shows that, even in the matter of changing precincts, as much as one year's residency in the new precinct can be required (Mississippi).

Absentee voting varies from state to state. Some states prohibit it altogether, and others prohibit it in the primaries. In many states, the law is very restrictive--for example, it is limited to persons who are absent for business reasons only or personal presence is required to qualify. Of those states that allow absentee voting, most have provisions for the physically disabled. Table 21 lists the major provisions.

Unless steps are taken to diminish the number of persons who would be disenfranchised in the case of attack and unless great care is taken in reconstituting all aspects of the election machinery, the very basis of the democratic system could be greatly weakened.

1. Merriam, R. E. & R. M. Goetz, Going Into Politics, Harper & Bros., New York, 1957.

Table 20

RESIDENCE REQUIREMENTS FOR VOTING
(Months)

<u>State or Other Jurisdiction</u>	<u>State</u>	<u>County</u>	<u>Precinct or Ward</u>	<u>City or Town</u>
Alabama	12	6	3	--
Alaska	12	--	1	--
Arizona	12	1	1	--
Arkansas	12	6	1	--
California	12	3	1.7	--
Colorado	12	3	0.6	1
Connecticut	6	--	--	6
Delaware	12	3	1	--
Florida	12	6	--	--
Georgia	12	6	--	--
Hawaii	12	--	3	--
Idaho	6	1	--	--
Illinois	12	3	1	--
Indiana	6	2†	1	2
Iowa	6	2	0.3	--
Kansas	6	1†	1	--
Kentucky	12	6	2	--
Louisiana	12	12	3	4
Maine	6	3	--	3
Maryland	12	6	6	--
Massachusetts	12	--	--	6
Michigan	6	--	1	--
Minnesota	6	--	--	--
Mississippi	24	--	--	12
Missouri	12	2	2	--
Montana	12	1	--	--
Nebraska	6	1.3	0.3	--
Nevada	6	1	0.3	--
New Hampshire	6	--	--	--
New Jersey	6	1.3	--	--
New Mexico	12	3	1	--
New York	12	4	1	4
North Carolina	12	--	1	--
North Dakota	12	3	1	--
Ohio	12	1.3	1.3	--
Oklahoma	6	6	1	--
Oregon	6	--	1	--
Pennsylvania	12*	--	2	--
Rhode Island	12	--	--	6
South Carolina	12	6	3	--
South Dakota	12	3	1	--
Tennessee	12	3	--	--
Texas	12	6	6	--

Table 20 (concluded)

<u>State or Other Jurisdiction</u>	<u>State</u>	<u>County</u>	<u>Precinct or Ward</u>	<u>City or Town</u>
Utah	12	4	2	--
Vermont	12	--	--	3†
Virginia	12	6	1	6
Washington	12	2	--	1
West Virginia	12	2	--	--
Wisconsin	6	--	0.3	--
Wyoming	12	2	0.3	--

* Six months if previously an elector or native of the state.

† Township.

Source: Council of State Governments, The Book of the States, 1966-67,
Chicago, Illinois.

Table 21

CIVILIAN ABSENTEE VOTING PROVISIONS

State	Absentee Voter Provisions	Procedure
Alabama	Elector whose business or occupation regularly requires his absence from county.	Apply in person.
Alaska	Elector unavoidably absent from home on election day and more than two miles distant from regular voting place.	Apply in person.
Arizona	Elector absent from county or physically disabled.	Request in person or in writing.
Arkansas	Elector unavoidably absent because of duties, occupation, or business or unable to go to polls because of illness or physical disability.	Apply in person or in writing.
California	Elector absent from precinct, unable to go to polls because of physical disability, or resides more than 10 miles from nearest polling place.	Apply in writing.
Colorado	Elector absent from county or ill or physically disabled.	Apply in person or in writing.
Connecticut	Elector absent from state or ill or physically disabled.	No absentee voting in primaries. Apply in person or by mail.
Delaware	Elector unable to go to polls because he is in public service of United States or state of Delaware or because of business or occupation or personal sickness or disability.	No absentee voting in primaries. Apply in person or through representative or apply in writing.
Florida	Elector absent from county on election day or physically disabled.	Apply in person or by mail.
Georgia	Elector required to be absent from city, county, ward, or district or physically disabled.	Apply by letter.
Hawaii	Elector absent from island of residence on election day.	Apply in person or in writing.
Idaho	Elector absent from precinct on election day or physically disabled or blind.	Apply in person or by mail.
Illinois	Elector absent from county in course of business or duties or physically disabled.	Apply in person or writing.
Indiana	Elector absent because of business or profession or physical infirmity.	Apply in person or by mail.
Iowa	Elector absent from county on business or other necessary travel or physically disabled or ill.	Apply in person or in writing.
Kansas	Elector absent from state or ill or physically disabled.	File affidavit.

Illinois	Elector absent from county in course of business or duties or physically disabled.	Apply in person or writing.
Indiana	Elector absent because of business or profession or physical infirmity.	Apply in person or by mail.
Iowa	Elector absent from county on business or other necessary travel or physically disabled or ill.	Apply in person or in writing.
Kansas	Elector absent from state or ill or physically disabled.	File affidavit.
Kentucky	Elector absent from county in course of business or duties on election day.	Apply in person or in writing.
Louisiana	Elector absent from parish on election day.	Apply in person.
Maine	Elector absent because of business or physical disability.	Apply in writing.
Maryland	Elector unavoidably absent from state, or any disabled or ill voter who is absent from ward or district on election day.	Apply in writing.
Massachusetts	Elector absent due to business or any other reason or physically disabled.	No absentee voting in primaries. Apply in writing, or in person.
Michigan	Elector absent from township or physically disabled.	Apply in person or by mail.
Minnesota	Elector absent from district or ill or physically disabled.	Apply to County Auditor.
Mississippi	Elector who is driver, operator, or crewman on common carrier in interstate commerce may vote in <u>absentia</u> , but cannot register in <u>absentia</u> .	Must vote absentee ballot in person.
Missouri	Elector absent from county, ill, or physically disabled.	Apply by mail.
Montana	Elector absent from county or physically disabled.	Apply to County Clerk.
Nebraska	Elector absent from county or physically disabled.	Apply in writing.
Nevada	Elector absent because of vocation, business, or other unavoidable cause or illness or physical disability.	Apply in person or in writing.
New Hampshire	Elector absent from place of voting or physically disabled.	No absentee voting in primaries. Apply in writing or in person.
New Jersey	Elector absent outside the state on election day, or elector <u>within the state</u> but unable to go to polls because of illness or physical disability.	Apply in writing.
New Mexico	No provision.	

Table 21 (concluded)

State	Absentee Voter Provisions	Procedure
New York	Elector unavoidably absent from residence because he is inmate of veterans' hospital or absent from county because of duties, occupation, business or responsibilities or ill or physically disabled.	No absentee voting in primaries. Apply in person or by mail.
North Carolina	Elector absent from county or ill or physically disabled.	No absentee voting in primaries. Apply in person or through member of family or in writing.
North Dakota	Elector absent from county or physically disabled.	Apply in person or in writing.
Ohio	Elector unavoidably absent and more than 10 miles from polling place on election day or physically disabled or ill.	Apply in writing.
Oklahoma	Elector absent from county on election day or physically incapacitated.	Apply in person or in writing.
Oregon	Elector absent from polling place or living more than 15 miles from his polling place or physically disabled.	Apply in person or in writing.
Pennsylvania	Any qualified elector unavoidably absent from county because of duties, business, or occupation or ill or physically disabled.	Apply in person or in writing.
Rhode Island	Elector absent from state or because of old age, physical disability, illness, or other physical infirmities unable to vote in person.	No absentee voting in primaries. Obtain affidavit.
South Carolina	No provision.	
South Dakota	Elector absent from precinct or ill or physically disabled.	Apply in person or in writing.
Tennessee	Elector absent from county because of business, occupation, health, education, or travel or illness or physical disability.	Apply in person or in writing.

Rhode Island	Electors absent from state or because of old age, physical disability, illness, or other physical infirmities unable to vote in person.	
South Carolina	No provision.	
South Dakota	Electors absent from precinct or ill or physically disabled.	Apply in person or in writing.
Tennessee	Electors absent from county because of business, occupation, health, education, or travel or illness or physical disability.	Apply in person or in writing.
Texas	Electors absent from county at time of applying for absentee ballot and to be absent during remainder of period or ill or physically disabled.	Apply in writing.
Utah	Electors absent from county and not within 20 miles of election district on election day or physically disabled.	Apply in person or by mail.
Vermont	Electors in town but unable to go to polls because of illness, injury, or other disability or necessarily absent from legal residence.	Apply in writing.
Virginia	Electors absent in regular and orderly course of profession, occupation, or other personal affairs or on vacation or as student at school or physically disabled.	Apply in person or by mail.
Washington	Electors absent from precinct or unable to vote due to physical disability.	Apply in person or by mail or by messenger.
West Virginia	Electors absent because of employment, business, or other unavoidable causes or physical disability.	Apply in person or by mail.
Wisconsin	Electors absent for any reason or unable to go to polls because of illness or physical disability.	Apply in person or in writing.
Wyoming	Electors absent from county or patient in hospital within county or physically disabled.	Apply in person or by mail.

Source: Constance E. Smith, Voting and Election Laws, Oceana, New York, 1960.

Election Machinery

Election machinery at present consists of a very complex set of rules, precedents, and procedures. Steps that would be necessary to put it back in operation after an attack could be extremely difficult. The steps that would be necessary to effect an election and a discussion of special difficulties that would be likely to be encountered are given below.

1. Census and redistricting--Overrepresentation by legislators of some areas would likely continue until a new census could be taken. At the present time, state legislators are allowed two years after a Census to reapportion Congressional seats. As a result of the 1960 Census, half of the states gained or lost seats. These changes in population generally come about slowly. Even California (which gained eight seats in the last decade), gained less than one seat a year. In the case of a nuclear attack, the change would be abrupt, but under present law, the inequities would remain until the next Census.
2. Party candidates, filing of petitions, and primaries--State and national elections are greatly dependent on the two major political parties. It is difficult to imagine the extent of disruption that would occur within the political party systems, but it would likely correlate with the degree of destruction and disruption in general. Party headquarters might be lost, and it is likely that many party officials would be killed or injured.

Lines of succession for party officials vary from state to state and from party to party. If a vacancy occurs in the chairmanship of the party in power, however, the President customarily fills the vacancy. If the chairmanship of the party out of power becomes vacant between campaigns, the national committee elects a new chairman. In any event, time would be needed to reconstitute committees from the local through the national level, candidates would have to be decided on, and petitions filed before primary elections could take place.

3. Financing candidates and campaigning--Campaigns, in the usual sense of the term, could be virtually impossible. The state of transportation, money and credit, and printing would preclude this. Sources for campaign funds would certainly be disrupted and lack of funds would be evident. It is likely that greater emphasis would have to be placed on radio and perhaps television and less on printed literature, personal appearances, and so on.

4. Replacement of supervisory personnel--In most states, the Secretary of State has responsibility for elections; and except in New England, the county usually serves as the administrative agency. Succession to the position of Secretary of State and Board of Election Commissioners has not been provided for in many states and counties. Since these offices are often elective, unless firm lines of succession are provided, a closed loop might be effected in the election process. Table 22 shows those states (29) that have effected succession laws for executive offices other than that of governor. According to OEP, this usually includes the Secretary of State.
5. Registration--Registration might present the most difficult hurdle. Most of the states (37) now have permanent registration (see Table 23). Nevertheless, since records would be lost in some areas and out of date in others, reregistration would be necessary.

The major registration requirements in the 50 states are shown in Table 24. Many require personal trips to the county seat, which might be virtually impossible--particularly in the case of a heavy attack which would disrupt the transportation system to a great extent. Some states require registration as much as nine months before election day. Many states allow voting in one's previous precinct when residence has been changed, but nevertheless, under present laws, many voters will be disenfranchised because of strict registration requirements.

6. Recreation of precincts and designation and arrangement of voting places--In areas of destruction, evacuation, or reception, precincts would have to be redrawn and polling places would have to be redesignated. It is expected, however, that this would be a relatively minor chore compared with the problem of reregistration.
7. Preparation, printing, and distribution of ballots--The loss of paper factories, transportation, printing machines, and lithographers would be likely to present a severe problem in making up ballots.
8. Procurement and distribution of election equipment and supplies--It is estimated that approximately half of the votes cast in the 1960 presidential election were with some type of voting machine. Since many machines would be destroyed and it is almost certain (except in the case of a very light attack) that new ones could

Table 22

STATES WITH EXECUTIVE SUCCESSION*

Arkansas	New Mexico
California	New York
Delaware	North Carolina
Georgia	North Dakota
Idaho	Ohio
Illinois	Oklahoma
Iowa	Oregon
Kansas	Pennsylvania
Louisiana	South Carolina
Maine	South Dakota
Massachusetts	Texas
Michigan	Vermont
Nebraska	West Virginia
New Hampshire	Wyoming
New Jersey	

* Other than the governor.

Table 23

STATES WITH PERMANENT REGISTRATION

Alabama	Minnesota
Arizona	Mississippi
Arkansas	Montana
California	Nevada
Colorado	New Hampshire
Connecticut	New Jersey
Delaware	New Mexico
Florida	North Carolina
Georgia	Ohio
Hawaii	Oklahoma
Idaho	Oregon
Illinois	Pennsylvania
Indiana	Rhode Island
Kansas	South Dakota
Kentucky	Tennessee
Maine	Utah
Maryland	Washington
Massachusetts	West Virginia
Michigan	

Table 24

REGISTRATION AND SPECIAL PROVISIONS

State	Registration	Special Provisions
Alabama	In person at court house up to within 10 days of election.	If move from one precinct or ward to another in same county within three months before election, may vote in former precinct at next election.
Alaska	No preregistration.	
Arizona	In person, for primary up to four months before general election; for general election any time up to the sixth Monday before general election.	If move from one precinct to another while registration closed, may vote in former precinct until registration reopens.
Arkansas	No registration system.	
California	In person, up to 53 days before election.	
Colorado	In person, up to and including 15th day before primary or election.	If move from one county to another within 90 days or from one precinct to another within 15 days before primary or general election, may vote by absentee ballot or at polling place in county or precinct where registered.
Connecticut	In person, usually up to fourth week before regular election.	If move from one municipality to another may vote in former municipality for one day less than six months afterward.
Delaware	In person, on 3rd Wednesday in July, first Saturday in August or third Saturday in October before election in even-numbered years. Additional registration days provided; notices posted.	If move within county when registration closed, voter may vote if properly identified at polls.
Florida	Apply any time up to 30 days before election.	
Georgia	In person at courthouse up to six months before election.	Apply to new county at least 10 days before election.
Hawaii	In person, up to third Wednesday before general election, and from fifth Friday before special election.	
Idaho	In person, up to last Saturday before primary and up to last Saturday before general election.	
Illinois	In person, up to 28 days before election. May register in precinct on announced days before election (counties of less than 500,000 pop.).	If move within precinct may transfer address with judges of election.
Indiana	In person, up to 29th day before election.	
Iowa	In person, up to and including 10th day before election (cities with permanent registration). In person, election day for anyone who has been absent on days fixed for registration (cities without permanent registration).	If residence changed within 10 days of election, vote in former precinct.

Idaho	In person, up to last Saturday before primary and up to last Saturday before general election.	
Illinois	In person, up to 28 days before election. May register in precinct on announced days before election (counties of less than 500,000 pop.).	If move within precinct may transfer address with judges of election.
Indiana	In person, up to 29th day before election.	
Iowa	In person, up to and including 10th day before election (cities with permanent registration). In person, election day for anyone who has been absent on days fixed for registration (cities without permanent registration).	If residence changed within 10 days of election, vote in former precinct.
Kansas	In person.	
Kentucky	In person, up to 59 days before primary or general election and 10 days before special election.	
Louisiana	In person up to 30 days before election.	If move from one precinct to another within parish may vote in former precinct for three months.
Maine	In person, up to 12 days before election.	Voter should vote in ward or precinct in which he resided on April 1.
Maryland	Register or transfer, up to 30 days before primary or special election and 42 days before a general election.	
Massachusetts	In person, up to 31 days before biennial state primary, presidential primary, and biennial state election and 19 days before city election or annual town meeting.	Residence on January 1 used for voting purposes throughout the year.
Michigan	In person, up to and including 30th day before any election.	If move from one precinct to another within same district, transfer registration on election day.
Minnesota	In person, up to 20 days before election.	
Mississippi	In person, up to 4 months before general election.	
Missouri	Separate and different provisions for registration for various cities and counties.	
Montana	In person, up to 45 days before election.	
Nebraska	In person, up to Friday before election.	
Nevada	In person, up to 30 days before election.	If move when registration closed, residence is not lost in former county or precinct.

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Table 24 (concluded)

State	Registration	Special Provisions
New Hampshire	In person, up to August 1 in even-numbered years.	Retain right to vote in town or ward of previous residence for period of 6 months before election.
New Jersey	In person, up to and including 40th day before election.	If move after registration closed, vote in former district.
New Mexico	In person, up to 30th day before election.	
New York	In person. Consult local Board of Elections for specific hours and days.	
North Carolina	In person, up to 21 days before election (with permanent registration). In person, up to 2nd Saturday before primary or general election. If voter becomes eligible to register after registration closed, register on election day (other areas).	If move less than 30 days before general election, vote in that election in former precinct.
North Dakota	In person on Tuesday before general election. No registration required to vote in primaries.	If move from one precinct to another, vote in former precinct until residence in new precinct established.
Ohio	In person, up to 41st day before primary or general election or on 11th day before special election.	If move from one precinct or county to another after close of registration, vote in former precinct for that election. If move within precinct, may vote.
Oklahoma	In person, up to 10 days before election.	
Oregon	In person, up to 30 days before election.	If move while registration closed, elector allowed to vote <u>once</u> after change of residence.
Pennsylvania	In person, up to 50 days before each general, municipal, or primary election.	If move from one address to another in same district, apply at least 10 days before primary or general election.
Rhode Island	In person, up to 60 days before election.	If move to different city, voter retains right to vote in former city for 1 day less than 6 months before election.
South Carolina	In person, at County Court House. Registration closed for 30 days before any election and closed before June primary until after second primary.	
South Dakota	In person, up to and including Tuesday before election.	
Tennessee	In person, up to 20 days before election in counties of 25,000 or more; or any time except the 10 days before election in counties of less than 25,000. A 2-day supplemental session may be held	

Pennsylvania In person, up to 30 days before each general, municipal, or primary election.
 Rhode Island In person, up to 60 days before election.
 South Carolina In person, at County Court House. Registration closed for 30 days before any election and closed before June primary until after second primary.
 South Dakota In person, up to and including Tuesday before election.
 Tennessee In person, up to 20 days before election in counties of 25,000 or more; or any time except the 10 days before election in counties of less than 25,000. A 2-day supplemental session may be held 20 days before election in areas remote from county seat.
 Texas In person, 9 months before election.
 Utah In person on 1st, 3rd, and 4th Tuesdays. If absent from county during regular registration days, register up to 10 days before any election.
 Vermont In person. Hearings to revise list are held by Board of Civil Authority 30 days before every election.
 Virginia In person, up to 30 days before election.
 Washington In person, up to 30 days before election.
 West Virginia In person, up to 30 days before election.
 Wisconsin In person, up to 2nd Wednesday before election. During 10 days before election, if not registered, may present affidavit.
 Wyoming In person, up to 15 days before any general or special election.

If move from one address to another in same district, apply at least 10 days before primary or general election.
 If move to different city, voter retains right to vote in former city for 1 day less than 6 months before election.
 Elector entitled to be registered in new district any time up to and including Saturday before election.
 If move from one town to another within 60 days of general election, may retain former residence for voting purposes in such election.
 Register on election day.
 If move when registration closed, vote in former precinct.

Source: Constance E. Smith, Voting and Election Laws, Oceana, New York, 1960.

not be built for years, manual methods of voting and counting would have to be used. This would undoubtedly be more difficult for those states whose elections now depend on machines than for those states that still use manual methods.

9. Selection and instruction of precinct officials--Election officials are selected almost everywhere on a partisan basis with the leaders of each party designating their choices for each precinct to the city, county, or state officials charged with the selection. Typically, five officials preside at each polling place, and all new officials need some training. At times, such manpower has been difficult to recruit. Nevertheless, laws do permit drafting citizens for these jobs in the same manner as is done for jury duty.
10. Identification of voters and counting of ballots--If other steps in the process of reconstituting elections machinery were adequately taken care of, these items should not be formidable. Hand methods, however, would slow down the reporting process, and results would be slower in coming in than is now usual.

Time to Fill Legislative Vacancies

A review of recent elections (1962-65) to fill vacated seats in the House of Representatives shows an average of three months between the resignation or death of a member and a new election replacing the old member. Some states have accomplished this in as little as one month, while others leave early vacancies unfulfilled for the remainder of the legislative session. It is difficult, if not impossible, to estimate the amount of time that would be needed to reconstitute election machinery in the postattack era. It would be greatly dependent on the extent of damage and disruption in general and the preparations that had been made preattack.

This study has emphasized problem identification, problem description, and other aspects of national vulnerability either of tangible or intangible nature. The development and evaluation of alternative countermeasures is more properly the concern of postattack research and recovery system evaluation. The description of the political problems cited would be incomplete without some explicit mention of some of the countermeasure possibilities, including some suggested elsewhere and some implicit in the problem discussion thus far.

Countermeasures

Many countermeasures that have been suggested throughout the report have received attention, although none have been developed to a degree that would ensure as orderly a democratic process as one would wish. These are listed below, together with their present status.

1. Amend the Constitution to authorize governors to fill temporary vacancies in the House of Representatives in case of a national disaster.

Status: Since the Constitution is difficult to amend, little progress has been made.

2. Enactment of legislative succession laws at the state level.

Status: About half of the states have enacted continuity of government laws in this connection.

3. Many recommendations of the recent President's Commission on Registration and Voter Participation would alleviate some of the problems inherent in reconstituting election machinery. Those particularly relevant to vulnerability of the United States to nuclear attack are:

- a. Each State should create a Commission on Registration and Voting Participation or utilize some other existing state machinery to survey in detail its election law and practices.
- b. Voter registration should be easily accessible to all citizens.
- c. State residence requirements should not exceed six months.
- d. Local residence requirements should not exceed 30 days.
- e. Voter registration should extend as close to election day as possible and should not end more than three or four weeks before election day.
- f. States should provide absentee registration for voters who cannot register in person.
- g. States should provide every possible protection against election fraud.

- h. Absentee voting by mail should be allowed for all who are absent from home on primary or general election day.

Status: Thirty-five states require more than six months residency, and 38 states require more than 30 days in the county to establish residency. Voter registration in 13 states must be completed more than one month before election day. Two states provide no civilian absentee registration, and another six have no provisions for illness or physical disability.

4. Succession to the position of Secretary of State and Boards of Election Commissioners should be provided for.

Status: Twenty-nine states have provided succession laws for executive offices other than the governor.

Continuity of government programs have made great strides in proposing model succession laws and in getting most states to enact such legislation. Nevertheless, since election is the only constitutionally approved method of filling some vacancies, it is suggested that attention be given to ways of effecting fair and honest elections in the shortest possible time after attack, giving special attention to some of the problem areas raised in this chapter. It should not be overlooked that the Constitution provides that Congress may make or alter regulations regarding the times, places, and manner of holding elections for Senators and Representatives.

In the case of legislative imbalance, proposed legislation at the federal and state levels is explicit and effective, but, as noted, has been enacted in only about half of the states. Even with the best laid plans of reconstituting election machinery, there would certainly be delays. There is no such thing as an instant election, even in normal times. Therefore, to preserve constitutional government, other standby legislation and emergency measures and organization are needed.

Assuming stopgap measures are taken as suggested above, they would only be meant to serve until such time as proper elections can be held again. Serious consideration needs to be given to measures that could be taken now by governments to assure a minimum of disruption to election machinery. Possibilities are plans for a special census (which could tie in with needs of the federal government for survivor information), preparation of emergency guidance for political parties, provision for election personnel replacement, preservation of election records, provisions for standby election materials (such as ballots), and standby instructions for manual voting and counting for those areas now using machine methods, in addition to improved registration laws already mentioned.

IX IMPLICATIONS OF POLITICAL PROBLEMS FOR RECOVERY MANAGEMENT

Major Problems

The political questions examined, namely problems of legislative imbalance and reconstitution of election machinery, could be gradually worked out if time permitted. As mentioned previously, the principle of one-man one-vote is very new in its current form, and temporary disenfranchisement of some survivors would be relatively unimportant in comparison with the survivors' economic problems. The drastic reorganization of business and government that is envisaged in Chapters II through VI would require prompt enactment of a great amount of temporary enabling legislation to provide a valid legal substructure for government activity. It would also require an unusual measure of popular support. Any impediments to objective and expeditious consideration of required legislation would lose time and support.

The problems thus would be less likely to arise from questions of membership in the postattack Congress and the state legislatures than from procedural questions governing the functioning of such bodies and particularly their committee structure and committee leadership. Membership questions could aggravate such problems but would be serious primarily in establishing quorums for committees and legislative bodies at large and in establishing committee leadership and rules. Any evidence of committee inaction or an inclination of legislatures to indulge in procedural debate would certainly lose popular support for government and undermine government leadership. This could result in exaggerated reliance on the emergency powers of the president and the governors to initiate action or, in such cases where executive response seemed inadequate, a tendency for local leadership whether duly constituted or unofficial to take action on their own responsibility without awaiting state or federal action.

The responsiveness of the legislative branches of government to the will of the people and the probable attitudes of particular legislators or groups of legislators cannot be anticipated. Any tendency for legislatures to be overresponsive to urban or metropolitan political interests could complicate the process of assimilating evacuees in rural areas and proper dispersal and reorientation of surviving industry. The importance

of such problems of individual biases or personalities cannot be predicted accurately. The more obvious hazards to our tripartite system of checks and balances appear to lie in the general sluggishness of judicial and legislative machinery.

The problems of legislative imbalance and postattack elections might thus be less important in themselves than certain collateral or secondary problems they engender; for example, those associated with quorum rules, committee structures, and election fraud. Comments on these problems are thus in order.

Collateral or Secondary Problems

The first and perhaps major problem that might present itself is that of a quorum. In the Senate and House of Representatives, a majority constitutes a quorum. However, all living members are counted for quorum purposes so that if enough Congressmen were injured rather than killed the Senate and House could be paralyzed.

At the state level, the Council of State Governments has proposed legislation to appoint temporary senators and representatives to serve until incumbents could recover. Unfortunately, all states have not enacted such legislation.

It is well-known that chairmen of committees in Congress have great power over legislation, and that they have these posts by virtue of seniority on their committee. An attack in which many legislators were killed would cause many chairmanships to change hands. It is conceivable that some legislators with few constituents could become chairmen of powerful committees (such as Appropriations, Rules, Ways and Means, etc.), and changes in legislation could be greatly affected. Redistribution of committee seats would also have to be effected.

The confusion that would be likely to exist in reconstituting election machinery might present great opportunities and therefore temptations for irregular procedures.

Problems of economic organization would undoubtedly be resolved one way or another, and the same is true of political problems such as those cited. The crucial question is one of time. In view of the marginal status of surviving resources, any time lost in using critical facilities to full advantage could prove to be a great extravagance. Thus it would be especially demoralizing to postattack survivors if excessive waste could be attributed to managerial indecision or ineptitude and legislative obstructionism. If an opportunity to express any dissatisfaction

with government action were denied large segments of the population through voter ineligibility, delays and confusion in holding elections, or other evidence of a lack of governmental sensitivity to popular sentiment, civil revolt could become widespread. Moreover, and this would be even more dangerous, general pressures on local authorities to promote local self-interest vigorously at the expense of national objectives would become irresistible in the absence of firm state and federal leadership. Political questions could be important for social stability, economic recovery, and national survival.

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